

Consumers' Research Bulletin



September 1951

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Consumers' Research Bulletin

OFF THE EDITOR'S CHEST

HOCUS POCUS, abracadabra! The season is upon us when economic medicine men are beating the drums and flailing their arms to exorcise that old devil inflation, also called the high cost of living. The chief incantations from the house of economic magic are for stringent price controls and rationing of scarce materials. There has been a Washington-centered attempt to foster the illusion that the mere passage of a law by Congress will endow some person or group of people with the ability to make beef more abundant in the butcher shop and less expensive. (No one goes so far as to suggest that prices will be reduced to pre-war levels.) Shoes and clothing prices presumably are to be brought down to price levels established by duly constituted authority. In general, the impression is given that the cost of living will not be allowed to exceed what government officials consider reasonable.

The medicine show this time, however, has failed to draw much of an audience. The advocates of economic controls have openly expressed bewilderment at that there was so little public interest in their efforts. Probably the overstocked state of most dealers' shelves accounts for their predicament. Textiles have been so plentiful that mills extended vacation closings and operated on shorter work schedules to cut down production. Appliances have been dumped on the market at sharp reductions in some cities, and it is common knowledge in trade circles that warehouses throughout the country have been jammed nearly to capacity with television receivers and home appliances of all kinds. Even the sale of automobiles, normally good in warm weather months, was recently reported as sluggish. Both retailers and consumers have found prices of carpets and other home furnishings too high and have curtailed their buying accordingly. On seasonal goods that could not well be carried over for another year, clearance sales have been staged, slashing prices as much as 50 percent. Public response to these sales is reported to have varied from a three hundred percent increase in volume to "virtually no effect at all."

Although it was obvious that consumers were not buying in the volume needed to sustain satisfactory business activity, the economic commentators were not agreed on just what the reason was for the unexpected phenomenon. Some suggested that prices were still too high. As one furniture dealer pointed out, in 1940 he sold a Beauvais Axminster rug for \$69.50; in

(Continued on page 23)



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Consumers' Research functions to provide unbiased information on goods bought by ultimate consumers. For their benefit (not for business or industry) and solely with the funds they provide, CR carries on tests and research on a wide variety of goods, materials, and appliances, and publishes the findings in CR Bulletin. Consumers' Research is a non-profit institution, and is organized and operates as a scientific, technical, and educational organization.

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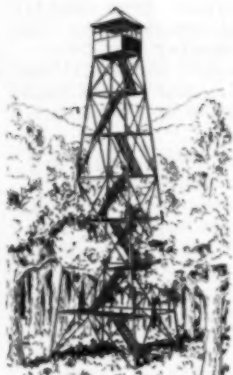
Symbols used to indicate sources of data and bases of ratings: A—recommended on basis of quality; AA—regarded as worthy of highest recommendation; B—intermediate with respect to quality; C—not recommended on basis of quality; cr—information from Consumers' Research's own tests or investigations; 1, 2, 3—relative prices, 1 being low, 3 high. Note that price and quality are completely differentiated in CR's listings; a quality judgment is independent of price; 50, 51—year in which test was made or information obtained or organized by the staff of Consumers' Research.

It will be advantageous if you will, whenever possible, send prompt notice of change of address at least 5 weeks before it is to take effect, accompanying your notice with statement of your old address with name in full. At least a month's notice must be given in any case. This rule, however, regarding long advance notice does not apply to military personnel.

*CR will, of course, gladly change addresses for men and women in the services as often as required by changes in station and other circumstances.

***For a brief cumulative index of 1951 BULLETINS preceding this issue, see page 24.

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The Consumers' Observation Post

THE OLD-FASHIONED CUSTOM OF BRUSHING your teeth on arising and before going to bed at night is now outmoded by recent scientific studies. The most effective procedure calls for brushing the teeth immediately after eating, according to Dr. Leonard S. Fosdick, of Northwestern University Dental School in Chicago, Commander William E. Ludwick and Captain C. W. Schantz, of the Navy Dental Corps at Great Lakes, Ill. Writing in the Journal of the American Dental Association, these researchers point out that even dentifrices containing substances such as ammonia were found to be ineffective in combating tooth decay, when used only in the morning and the evening. Dentifrices to be effective, they warned, must be used immediately after eating, particularly after eating refined carbohydrates such as sugar.

AMERICAN TOBACCO COMPANY, MANUFACTURER OF LUCKY STRIKE CIGARETTES, has been the recent subject of action by the federal government for misleading advertising claims made some time ago that independent tobacco experts prefer Luckies "2 to 1." The Federal Trade Commission, which looked into the matter, reported that a number of the "experts" involved had no connection with the tobacco business and that "Of 440 of the 1,184 persons claimed by the respondent [American Tobacco Co.] to be exclusive smokers of Lucky Strike cigarettes, approximately fifty did not smoke cigarettes at all. More than 100 of the 440 witnesses did not smoke Lucky Strike cigarettes exclusively, and a number of them smoked other brands exclusively." As CR has pointed out before, the use of marketing surveys to "prove" some claim favorable to a particular brand should certainly be looked upon with increasing suspicion by informed consumers and the current F.T.C. findings add further support to our position.

CRUDE BLACK MOLASSES, sometimes called "blackstrap," has achieved recent popularity as a health food. It is richer in iron than ordinary molasses but is not to be considered a cure-all for anemia or other ills. Earlier this year the Food and Drug Administration took action against two individuals for selling crude molasses by mail with the claim that it was a "Wonder Food" and would cure a host of diseases including cancer, tuberculosis, and heart disease. The two men involved were fined \$1000 each for violation of the Federal Food, Drug, and Cosmetic Act.

FOR BUSINESSMEN TO GET TOGETHER AND FIX PRICES is a practice forbidden by the Sherman Anti-trust Act. As a rule trade unions have been exempt from prosecution for any price-fixing activities. It was therefore a shrewd move when a number of gasoline station operators, in an attempt to stop recent price cutting wars in New Jersey, voted to form a union under A.F.L. affiliation. As one spokesman for the proposed new union put it, according to the New York Herald Tribune, "We can get together and say that we will raise prices, but we have no economic fear of each other. We have to have an organization which can enforce our agreements." With a union, he added, "we can put pickets on the man who cuts prices and through union affiliation we could stop supplies being shipped into the state." It will be interesting to see whether federal authorities will recognize their obligation to protect consumers in this case.

HOLEPROOF HOSIERY COMPANY puts out a line of full-fashioned hosiery of high crepe twist construction, treated with its "Beauty Lock" process, claimed to make such hose less susceptible to snagging. The "Beauty Lock" process is a chemical treatment that binds the threads and filaments more closely together

and makes them less susceptible to snagging than untreated fibers. Some skeptic apparently complained to the Federal Trade Commission that the company was misrepresenting its product, for the Commission looked into the matter and came forth with an order dismissing the complaint. The F.T.C.'s docket was cautious, but the conclusion may perhaps fairly be drawn that the F.T.C. considered Hole-proof's "Beauty Lock" process had some merit in rendering hose snag resistant.

* * *

IT HAS BECOME FASHIONABLE TO HAVE ANEMIA, comments Dr. M. Pinson Neal of Columbia, Mo. Writing in the Journal of the American Medical Association, Dr. Neal points out that malnutrition can exist on "three square meals daily" and that nutrition is to some degree involved in most diseases. He suggests that too many, particularly school children, reach for a candy bar instead of an apple or an orange.

* * *

THE MODERN AUTO CHASSIS AND BODY are built to outlast two engines, given proper care, claims E. A. Jaderquist in a recent issue of Motor Trend. After a car has gone 100,000 miles, it is time to shop for a new engine. For the unsuspecting customer, particularly in the Los Angeles area, securing a competent rebuilding job is full of pitfalls. Mr. Jaderquist outlines a few of the worst tricks, such as sensationally-low-price advertisements, which bring the customer in and allow the salesman to go to work on him. Then follows the attempt to sell a more expensive engine; the prospective customer's car in the meantime may have been partly dismantled and there will be a charge for putting it back together unless the engine job is authorized; extra work will be done on the rebuilding job and charged for accordingly; and spare parts are sometimes charged for at prices as high as 70 percent over list. To avoid being victimized by such rackets, it is wise to check first to make certain that you are dealing with a reliable, honest shop or mechanic, and get a complete work order filled out with a duplicate which you should keep for reference when the bill comes in. If you have any doubt about the reliability of a particular mechanic or shop, check with the local Better Business Bureau, which, particularly in big cities, has records of complaints regarding local concerns.

* * *

ASTRINGENTS for checking perspiration are frequently based on the use of aluminum salts and often have a disastrously tenderizing effect on clothing with which they come in contact. A new compound, aluminum methane disulfonate (aluminum methionate) has been discovered by Professor John E. Christian and Dean Glenn L. Jenkins of the Purdue University School of Pharmacy. The report of their findings which appeared in a drug trade journal indicated that the researchers claimed that their new compound is as effective (on a percentage basis) as aluminum sulfate, aluminum chloride, and aluminum ethane disulfonate. Two claimed advantages in its use are: It is hygroscopic and will therefore prevent creams containing it from drying out; it is less harmful to fabrics than a number of other common astringent agents.

* * *

THE PREDICTED DEATH OF FM, high fidelity, radio broadcasting has been greatly exaggerated, according to Audio Engineering. Investigations by the National Association of Radio and Television Broadcasters indicate that FM is slowly increasing in popularity in the South and in Metropolitan New York. Partly the rise in interest is credited to the poor quality of audio systems in TV sets which are characterized as the sort that would be a disgrace even to a \$20 hearing aid. One outstanding advantage of FM is that it is free from static and brings music to the listener without the objectionable noise that is characteristic of AM broadcasting in many parts of the country during the summer months.

* * *

WIDESPREAD USE OF DDT, a highly effective insecticide, presents a serious hazard to human health, according to a witness before a congressional committee investigating the use of chemicals in food products. Tests conducted under the supervision of John Dendy, head of the Texas Research Foundation, showed contamination of meat and milk with DDT. Source of the traces of DDT was ascribed to the animals' feed.

(The continuation of this section is on page 29)

Refrigerators for 1951

THE 1951 refrigerators seem to be very much like those of previous years except that there is a tendency to use automatic defrosting devices as an inherent part of the refrigerator design. Probably this is a useful addition, as most housewives tend to neglect the defrosting of their refrigerators. When the ice gets to be too thick on the unit, the efficiency of operation is reduced so that more electricity is required to provide proper refrigeration of the food.

On the *Westinghouse*, which has a built-in defrosting device, opening and closing the door operates a counting mechanism. After 60 openings of the door, an electric heater unit is energized which warms up the refrigerator. The passage of this through the coils of the evaporator (walls of the freezing chamber) quickly melts off the frost. By this method of defrosting, which required $\frac{1}{4}$ to $\frac{1}{2}$ hour depending upon the setting of the thermostat control, there should be no significant effect on the temperatures of foods in the refrigerator, and even frozen foods in the freezer compartment would not suffer a harmful temperature rise during the defrosting period. Under test at a room temperature of approximately 80°, with a load in the refrigerator and control set at "Normal," the air temperature in the freezer compartment increased 18° (from 14° to 32°) during defrosting. In about one hour from the start of the defrosting period, the temperature inside the freezer compartment was back to a normal of 14-18°. The defrost water drains into a pan at the bottom of the refrigerator where it is evaporated into the room by the circulation of warm air. At the end of the defrosting period the heater shuts off and the refrigerator resumes normal operation.

The automatic defroster of the *Crosley* refrigerator operates on a different principle. A built-in electric clock automatically energizes the heater associated with the refrigerant coils, at a fixed time each night. While the manufacturer claims that only 2 to 10 minutes are required to complete the defrosting, CR's tests showed that the heater operated for 12 to 16 minutes and that the air temperature in the freezer compartment increased 30° (from 20° to 50°). About one hour elapsed before the temperature returned again to that obtaining before the defrosting cycle started. A control is provided to permit a change from automatic to manual defrosting.

Those who wish to convert their present refrigerators so that they will defrost regularly can obtain an attachment, several makes of which are now on the market at about \$10 to \$15, which shuts

off the refrigerator for a period of up to 5 hours each night so as to permit it to defrost. These devices are not so effective as those used in the best of the automatic defrosting refrigerators, for the long time during which defrosting occurs can produce a substantial rise in temperature in the box and also



General Electric Model LC-8-HC



International Harvester Model HA-84

permit partial thawing out of frozen foods stored in the freezer compartment with a consequent loss in flavor and quality. CR can advise its subscribers tentatively that among the widely sold defrosting devices, the *GE Model T-47 Time Switch* and the *Paragon Defrost-It* (Paragon Electric Co., Two Rivers, Wis.) have performed well in service (except for the disadvantage just mentioned, which is inherent in all separate-unit defrosting devices).

Shelves built into the door, long a feature of *Crosley*, are now being used by other manufacturers. Both *International Harvester* and *Westinghouse* refrigerators had this desirable feature.

Three *Philco* and four *Kelvinator* refrigerators were provided by the manufacturers. These refrigerators were tested by the same independent laboratory making CR's tests and under the same conditions except that the pull-down test of the *Philco* units was made at 104°F instead of the usual 110°F and no-load tests were made only at 90°F room temperature. In Table I, figures for pull-down time on *Philco* at 110° are estimated, followed by the actual figures at 104° room temperature, in parentheses. The *Philco* units were stated to be pre-production models and hence may not be fully representative of this make of refrigerator in regular production. The findings are given, however, in view of the good performance of *Philco* refrigerators in CR's tests conducted in 1950. At the time of going to press, tests on the *Kelvinator* refrigerators and on a new electric-powered model of the

Servel Electrolux were not completed. These will be presented in a forthcoming issue of *CONSUMERS' RESEARCH BULLETIN*.

Test Methods

The refrigerators were allowed to stand in a room heated to a constant temperature of 110° (*Philco* at 104°) with their doors open until all the parts were at room temperature. The doors of the boxes were then closed and the refrigerator turned on; measurements of the electrical energy consumed were taken at one-half hour intervals until the average temperature reached a value of 46°F or lower. Curves were plotted from these data, and the time taken, and electrical energy consumed to bring the temperature in each box to 46°F were determined. This analysis gives a measure of the refrigerating capacity (adequacy of the refrigerator unit to handle its load) of each unit. There were wide differences in the time required for the various boxes to "pull the temperature down" from 110°F to 46°F (see Table I). The *GE* accomplished this in 2.3 hours, but the *Crosley* could not lower the temperature to 46° in 12 hours (though 46° or below is required for safe storage of many foods). The pull-down test is not only a measure of the ability of the refrigerator to stand up to extreme hot-weather conditions, but also gives a measure of the "reserve capacity" of the machine, a point of practical importance in the use of any refrigerator, especially

Table I

Table showing time required for the various refrigerators to be "pulled down" in temperature from 110°F (temperature, outside and at start inside of box) to 46°F.

	Price	Actual cu. ft. ¹	Price per Actual cu. ft.	Number of hours required to reduce temperature to 46°F in "pull-down" test from 110° or 104°	Hours per cu. ft. at 110° or 104°
<i>Philco F-1112</i>	\$330	11.0	\$30.00	3.1 ² (2.55) ³	0.27 ² (0.23) ³
<i>Philco F-1115</i>	360	11.0	32.70	3.2 ² (2.7) ³	0.29 ² (0.24) ³
<i>General Electric LC-8-HC</i>	300	7.7	39.00	2.3	0.30
<i>International Harvester HA-84</i>	330	8.9	37.00	3.25	0.37
<i>Westinghouse DFC-8</i>	390	8.4	46.40	3.3	0.39
<i>Philco F-915</i>	300	9.0	33.30	4.6 ² (3.8) ³	0.51 ² (0.42) ³
<i>Crosley Shelvador SAC-9</i>	370	9.5	39.00	12+	1.3+

¹Total, food storage plus frozen-food compartment.

²The number of hours at 110° is an estimate, in these cases.

³Actual time, at 104° room temperature.

in places where there is a long spell of hot summer weather or temperatures in the kitchen from cooking and baking are exceptionally high.

After stable temperature conditions were reached, performance data were obtained with different settings of the control dial, the temperature in the test room being maintained in one case at 90°F and in another at 110°F.

By experience it has been learned that the cost of operating a refrigerator loaded with food and used under average conditions in a home will often be close to the operating cost determined under test conditions in a room held accurately and constantly at 80°F. Operating costs at 80°F have been approximately determined by calculation and are given in Table II. If there is a considerable "food load," which implies putting into the refrigerator from time to time foods which are warm or at room temperature, the performance of the refrigerator at a room temperature of 90° will more closely approximate the operating cost to the consumer. It should be noted that the differences in energy consumption between two new samples of any given model of electric refrigerator may amount to as much as 15 percent, and that a range of variation of 5 to 10 percent is common, due to unavoidable non-uniformity in manufacture. The percent of the time during which the motor ran was determined at both 90°F and 110°F. A low figure is desirable as it tends to indicate adequate refrigerating ca-

capacity and longer life for the refrigerator mechanism. It should be noted that at 110°F the *Westinghouse* ran only 18 percent whereas the *Crosley* ran 47 percent of the time, or about 2½ times as much.

In the ice-making tests, the time to make the regular complement of ice cubes, with the box in a room at 110°F, was measured.

In the listings, only the time for freezing the full complement of ice cubes is given; the time to freeze cubes in particular locations varied according to the location of the trays. In the *International Harvester* refrigerator, for example, cubes in the tray on the lower shelf were frozen solid in 2 hours, but the others were not completely frozen until 4 hours had elapsed.

The GE, *International Harvester*, *Westinghouse*, and *Crosley* started satisfactorily on low voltage (approximately 90 percent of rated voltage), and the starting current (except for the *Crosley*) of the refrigerators under normal conditions was 15 amperes or less; they also operated satisfactorily in the over-load test (carried out by stalling the motor with opening and quick closing of the circuit). On the *Crosley*, starting current was 15.8 amperes, and 18 amperes when motor was stalled. (Neither of these tests was made on the *Philco* models.) The refrigerators (except the *Philcos*) were given tests to determine the amount of sweating of the outer surfaces at relative humidities ranging from 70 percent to 90 percent.

Table II

A comparison of monthly operating costs of 1951 refrigerators tested by CR. The electric rate is assumed to be 3½¢¹ per kwhr. The figures in column 4a are monthly operating costs per cu. ft. of total storage space at 90° room temperature.

1	2	3	4	4a	5		
	Total Storage Capacity, cu. ft., Actual	Estimated Monthly Operating Cost at Room Temperatures of					
		80°	90°		110°		
				per cu. ft., cents	% running time		% running time
<i>General Electric LC-8-HC</i>	7.7	\$0.62	\$0.82	10.7	20.8	\$1.44	37.2
<i>Philco F-1115</i>	11.0	0.95	1.26	11.5	24	—	—
<i>Philco F-1112</i>	11.0	0.99	1.32	12.0	25	—	—
<i>Westinghouse DFC-8</i>	8.4	0.77	1.03	12.3	18.6	2.32	41.5
<i>International Harvester HA-84</i>	8.9	0.83	1.11	12.5	24.2	2.06	47.8
<i>Philco F-915</i>	9.0	0.92	1.22	13.5	27	—	—
<i>Crosley Shelvador SAC-9</i>	9.5	1.44	1.92	20.2	47	2	100%

¹Approximate operating costs at other rates may be computed by simple proportion. For example, if you pay on the average 2½¢ (instead of 3½¢) per kwhr., the operating cost of the *Westinghouse* becomes 2½ × \$1.03 ÷ 3½ or approximately 73¢ per month.

²Did not reach 46°F with motor running continuously.

All of the refrigerators were satisfactorily quiet in operation and the units were of the sealed type. Relative operating costs are shown in Table II, and to save space are not repeated in detail in the listings. Outside dimensions given in the listings include hardware. The prices shown are list prices.

A. Recommended

Philco, Model F-915 (Philco Corp.) \$300. Total rated capacity, 9.1 cu. ft. (actual, 9 cu. ft.). Rated shelf area, 14.1 sq. ft. (actual, 14.1 sq. ft.). Dimensions, 60½ in. high, 28½ in. wide, 28½ in. deep. Motor hp., 1/6. Condenser, plate type. Insulation, glass wool. Frozen-food compartment (volume, 0.8 cu. ft.) located at top of refrigerated space and extends full width of storage space. Combined "chiller" and drip tray located below freezer. Had 4 ice-cube trays (total, 7½ lb. of ice cubes). Time required to lower temperature from 104°F to 46°F, 3.8 hr. (equivalent to about 4.6 hr. at room temperature of 110°F), satisfactory. Ranked sixth (next to highest) in cost of operation (13.5c) per cu. ft. per month. Maximum time required to make 7½ lb. of ice cubes, 4.7 hr. (0.63 hr. per lb.), about average. 1

Philco, Model F-1112 (Philco Corp., Philadelphia) \$330. Total rated capacity, 11 cu. ft. (actual, 11 cu. ft.). Rated shelf area, 18.8 sq. ft. (actual, 19 sq. ft.). Dimensions, 61 in. high, 30½ in. wide, 28 in. deep. Motor hp., 1/6. Condenser, plate type, at rear of cabinet and cooled by natural circulation of air. Insulation, glass wool. Frozen-food compartment of 1.4 cu. ft. volume is located at top of refrigerated space and extends across the full width of storage space. Combined "chiller" and drip tray located below freezer. Equipped with baffles to change flow of air in cabinet for different temperature conditions inside the freezer space. Had 4 ice-cube trays (total of 7½ lb. of ice cubes). Time required to lower temperature from 104°F to 46°F, 2.55 hr. (equivalent to about 3.1 hr. at room temperature of 110°F), favor-

able. Ranked third in cost of operation (12c) per cu. ft. per month. Maximum time required to make 7½ lb. of ice cubes, 3 hr. (0.4 hr. per lb.), good. All *Philco* refrigerators are warranted for 1 yr. against defects in material and workmanship; units are warranted for 5 yr. 1

Philco, Model F-1115 (Philco Corp.) \$360. Similar to *Model F-1112*, except equipped with 2 instead of 1 vegetable drawer and had a covered meat compartment in one half of the drip tray. Time required to lower temperature from 104°F to 46°F, 2.7 hr. (equivalent to about 3.2 hr. at 110°F). Ranked second in cost of operation (11.5c) per cu. ft. per month. Maximum time required to make 7½ lb. of ice cubes, 2.5 hr. (0.33 hr. per lb.), very good. 1

General Electric, Model LC-8-HC (General Electric Co., Bridgeport, Conn.) \$300. Total rated capacity, 8.2 cu. ft. (actual, 7.7 cu. ft.). Rated shelf area, 13.7 sq. ft. (actual, 14.8 sq. ft.). Dimensions, 59¼ in. high, 30 in. wide, 29 in. deep. Motor hp., ¼. Condenser, plate type, at the rear of the cabinet and is cooled by natural circulation of air. Insulation, *Fiberglas*. Frozen-food compartment of 1.4 cu. ft. volume is located at the top of refrigerated space and extends across the full width of the storage space. Shelves were made of aluminum. A "chiller" tray located immediately below the baffle beneath the evaporator is to be normally used in the forward position but pushed back when defrosting or for extra cold temperature in the freezer. The refrigerator is equipped with an indicating device to show when to defrost. Had 4 (1¾ lb.) ice-cube trays (total, 7 lb., 64 ice cubes). Slight sweating of cabinet over a very small area at relative humidities of 84 and 90%. Time required to lower temperature from 110°F to 46°F, 2.3 hr., favorable. Ranked first (lowest) in cost of operation (10.7c) per cu. ft. per month. Maximum time to make 7 lb. of ice cubes, 4½ hr. (0.64 hr. per lb.), about average. All parts except unit warranted for 1 yr. against defects in material or workmanship. Sealed-in unit warranted for 5 yr. 2



Westinghouse Frost-Free Model DFC-8



Crosley Shelvador Model SAC-9

Hotpoint Special DeLuxe, Model EC82-5 (Hotpoint, Inc., 5600 W. Taylor St., Chicago 44) \$300. Essentially the same as *General Electric Model LC-8-HC*. 2

International Harvester, Model HA-84 (International Harvester Co., Chicago) \$330. Total rated capacity, 8.4 cu. ft. (actual, 8.9 cu. ft.). Rated shelf area, 16.7 sq. ft. (actual, 16.7 sq. ft.). Dimensions, 59½ in. high, 29½ in. wide, 29 in. deep. Motor hp., ¼. Condenser, plate type, at the rear of the cabinet, cooled by natural circulation of air. Insulation, glass fiber. Frozen-food compartment (volume, 1.5 cu. ft.) located at the top of refrigerated space, extends full width of the storage space. A plastic drip tray, which serves also as a "chiller" tray, is located below the evaporator. At each side of this tray, there is a vane which is opened in summer and closed in winter and when defrosting. Had 4 (about 1.7 lb.) ice-cube trays (total, 6¾ lb., 56 ice cubes). Moderate sweating on parts of both sides of cabinet at relative humidity of 84%. Time required to lower temperature from 110°F to 46°F, 3.25 hr., favorable. Ranked fifth in cost of operation (12.5c) per cu. ft. per month. Maximum time to make 6¾ lb. of ice cubes, 4 hr. (0.59 hr. per lb.), about average. Warranted for 1 yr. against defects in material and workmanship. Sealed-in unit warranted for 5 yr. 2

Westinghouse Frost-Free, Model DFC-8 (Westinghouse Electric Corp., Mansfield, Ohio) \$390. Total rated capacity, 7.9 cu. ft. (actual, 8.4 cu. ft.). Rated shelf area, 15.28 sq. ft. (actual, 15.0 sq. ft.). Dimensions, 61¼ in. high, 31 in. wide, 26½ in. deep. Motor hp., 1/6. Condenser, plate type, at the rear of the cabinet, cooled by natural circulation of air. Insulation, fiberglass. Frozen-food compartment (volume, 1.2 cu. ft.) located at the top of refrigerated space, extends full width of storage space. Water from defrosting drains into a pan in the motor compartment where it evaporates (see text). A "Sterilamp" is provided which operates when the unit is running. Has compartment located above freezer for storing butter at temperature for easy spreading. Had 2 small (1¾ lb.) and 1 large (3½ lb.) ice-cube trays (total, 7 lb., 56 ice cubes). Slight sweating of cabinet over a very small area at relative humidity of 84% and moderate sweating at 90%. Time required to lower temperature from 110°F to 46°F, 3.3 hr., favorable. Ranked fourth in cost of operation (12.2c) per cu. ft. per month. Maximum time to make 7 lb. of ice cubes, 3.5 hr. (½ hr. per lb.), about average. All parts except unit warranted for 1 yr. against defects in material or workmanship; sealed-in unit for 5 yr. 3

C. Not Recommended

Crosley Shekador, Model SAC-9 (Crosley Div., Avco Mfg. Corp., Cincinnati 25) \$370. Total rated capacity, 9.5 cu. ft. (actual, 9.5 cu. ft.). Rated shelf area, 17.93 sq. ft. (actual, 18.0 sq. ft.). Dimensions, 58 in. high, 31¼ in. wide, 28½ in. deep. Motor hp., ¼. Condenser, finned-tube type, located at the bottom in 2 tiers and cooled by natural circulation of air. Insulation, mineral wool or glass fiber. Frozen-food compartment (volume, 1.5 cu. ft.) located at the top of refrigerated space, extends the full width of storage compartment. A plastic baffle, 1 in. thick, is placed 1 in. below the evaporator. A regulating vane is located at the rear of the baffle. Had 3 ice-cube trays (total, 5¼ lb., 42 ice cubes). Some sweating of cabinet was notice-

able at 75% relative humidity; extensive sweating at 90% relative humidity. Time required to lower temperature from 110°F to 47.8°F, 12 hr., very poor. Ranked highest in cost of operation of refrigerators tested (20.2c) per cu. ft. per month. Maximum time to make 5¼ lb. of ice cubes, 4 hr. (0.76 hr. per lb.), poor. All parts except unit warranted for 1 yr. against defects in material and workmanship; sealed-in unit for 5 yr. 2

Kitchen Sink Drainage and the Septic Tank

A RECENT BULLETIN from the Housing and Home Finance Agency, Washington 25, D. C., Technical Paper No. 14, May 1950, on Septic Tank Studies, reports that the interval between necessary cleanings of home septic tanks could be extended to four and a half years¹ by providing effective storage capacity of twice the one-year scum and sludge accumulation. A further item of interest is that scum and sludge accumulations in tanks receiving all waste from the home averaged only 11 percent more than the accumulation rates for tanks receiving bathroom waste only. (These were homes which did not use garbage grinders or disposal units.) The findings tend to indicate that it is not important to provide a special or separate means of disposal for kitchen wastes, and it is the present view of the H.H.F.A. that the normal kitchen sink discharge (liquids) may be distributed through the drainage piping system to the septic tank without an intervening grease trap. A grease interceptor, however, *should* be used where there is a separate absorption field for kitchen wastes. Experience, however, indicates that such traps are seldom cleaned at the proper time, and even when they are cleaned, getting rid of the contents is a definite nuisance.

There are a number of advantages in following the Housing and Home Finance Agency's suggestion that kitchen wastes be disposed of to the septic tank: There is less expense for the disposal system, longer detention time, opportunity for biological reduction of the volume of solids, and the effluent is more easily disposed of in the soil.

Discharge of wastes directly to the septic tank without a grease interceptor does not apply for sewage systems serving camps, restaurants, etc., where large volumes of grease may be discharged through sink drains.

¹Information available from various authorities indicates that the time between cleanings of septic tanks may vary over a wide range. Some advise inspection once a year; others, every three years. Cleaning is required at intervals varying from three to six years or more, even up to ten years; or, in the opinion of various experts, when scum and sludge have accumulated to a combined thickness of ten or twenty or even twenty-four inches, or one-third or more of the depth of the tank.

Thirteen Binoculars

THE average consumer has a difficult problem if he tries to buy a pair of prism binoculars without some expert guidance, for the exterior of binoculars, as with the case of a watch, may conceal parts of fine workmanship and careful finish or poor construction with very low quality of adjustment. Apart from this question of quality, however, there are questions of type to be considered. The individual must decide first between central focus and individual focus. In the central-focused glasses there is a single focusing wheel which moves both eyepieces at the same time, and there is usually one eyepiece which is adjustable to take care of the differences between the observer's eyes. This arrangement has the advantage of permitting the focus to be changed with a single, quick motion after the adjustable eyepiece has been set for the individual. With the other type of glass the two eyepieces are focused *separately* for each change in focus setting; this may involve some time and trouble with considerable likelihood of one of the two foci not being correct. The individual focus arrangement has advantages, however, in that it makes binoculars easier to waterproof, and the construction being simple and more rigid permits such glasses to hold their collimation (optical axes, or lines of sight, accurately parallel) a longer time and through more use.

Another decision the individual buying binoculars must make is what magnification and light-gathering power he needs, and these, particularly the latter, are determined by size of the objective lenses and have a great effect upon the price he will pay for his instrument. (A 6x30 binocular of one make costs about \$125; a 7x50 of the same make, about \$175.) High magnification (anything over 8x) should, in general, be avoided except in unusual circumstances; the higher magnifications tend to go with a poor image (especially if any parts are loose) and difficulty in seeing due to wavering of the image when the binocular is held in the hand, so that a rigid support may be needed to give a satisfactory view in some cases. The higher magnifications also go with a poorer image when there are atmospheric disturbances, such as heat currents, and finally a decreased field of view. Usually the lowest magnification that will serve the purpose is the best and most economical choice for a binocular. The Navy, for instance, uses 7x50 binoculars and the Army 6x30. (The first figure gives the magnification, and the second the diameter of the objective lens in millimeters — approximately equivalent to 25ths of an inch.)

Increase of magnification reduces the light-gathering power of the binoculars and thus reduces the brightness of the image, unless there is a corresponding increase in the diameter of the objective lenses, and such an increase, of course, means greater size and weight of the binoculars. The larger binoculars are awkward to handle and to carry, and are more subject to extensive damage in case of accident.

The diameter of the pupil of the eye of an individual varies from about 2 mm. to 7 mm., and in order to utilize the maximum ability of the eye to gather light, the exit pupil of the binoculars should be about 7 mm. The exit pupil is found by dividing the effective diameter of the

objective lens by the magnification. Since with a 7x50 or a 6x42 glass the exit pupil is about 7 mm., either may be used as a night glass. However, because of their somewhat greater bulk, such binoculars unless used a great deal at night are not particularly advantageous as compared with binoculars having a smaller exit pupil, such as a 7x35 or a 6x30 glass. For those who need to use binoculars only when there is a considerable amount of light available, an even smaller exit pupil might suffice.

The individual who wears corrective glasses and who finds it necessary to wear them when using binoculars



has an additional problem. A good many people would probably find it convenient to look through binoculars without wearing spectacles — it depends to a large extent on the nature of the corrective lenses in the spectacles. The eye distance, noted in the listings, indicates the position of the exit pupil and therefore the position of the pupil of the observer's eye if the entire field is to be seen and all the available light utilized. For an observer with no glasses, there is no difficulty in positioning the eye pupil at the correct distance from the eyepiece mount, but if glasses are worn, the distance from the pupil of the eye to the front vertex of the spectacles may be as much as 12 mm. and removal of the "eye cup," which may have a depth of as much as 6 mm. itself, may be necessary in order to permit the eye to be close enough to the eyepiece. The depth of the eye cups of those tested were all between 5 and 8 mm., and the exit pupil position ranged from 5 mm. for the *Unidentified French 12x45* to 14.5 mm. for the *Ofuna* and *Vista*; thus it would not, in general, be possible for a person wearing glasses to position correctly any of the binoculars reported unless he were to remove the eye cup — which is an inconvenient and undesirable expedient.

Having decided on the type of focusing device, magnification, and the light-gathering power desired, one may proceed to the actual selection of the binoculars. It is not always easy to determine just what make is being examined, for many binoculars, particularly those of foreign manufacture, are not marked with the manufacturer's name, and others may be a counterfeit of the product of a famous maker (Zeiss, for example). In addition, there are the brands in which the name shown on the binoculars is one chosen by the dealer, his so-called "private brand," and the same name may be used on several different makes. As a general rule, it is not wise to buy binoculars of unknown manufacture or binoculars advertised as "bargains." Such "bargains" or a glass of little-known make, if purchased, should be obtained on a basis providing for full refund in case they should prove unsatisfactory and should be checked thoroughly either against binoculars known to be high grade, or preferably by a qualified physicist or optical expert, for they will very often be of inferior adjustment. Very accurate work and close adjustment are required in order to make high-quality binoculars.

There are some things the consumer can check which are quite helpful to indicate the general quality of the binoculars being examined. These are the mechanical finish, the engraving, and particularly the hinge action, which should be smooth and uniform. Any signs of unevenness in the action of the hinge or focusing mechanisms or carelessness on the part of the manufacturer in finishing or engraving (such as poor matching or cementing of parts and faint or irregular markings) should suggest extra care and attention in buying. Since many readers may be unfamiliar with the distinguishing marks of fine workmanship in optical instruments, they should make it a point to examine in the store (or in some other store, if necessary), a pair of binoculars known to be of high grade, say one of Zeiss or Bausch & Lomb make, and note the way parts are finished, and the graduations executed; then the defects of lower-quality instruments will become apparent to the observing consumer.

Defects that are common in binoculars and which should be cause for rejection are loose objective lenses or looseness of construction of any kind; dirty optical parts (lenses or prisms) showing the presence of dust, lint, or

moisture films. When prisms are "gray," as was noted in a few cases in the listings, the significance is that the glass surface was not completely polished, but the defect is not necessarily a cause for rejection if all other factors are favorable.

Collimation, defined in the first paragraph of this article, is the most important adjustment, for even a slight deviation from parallelism of the two optical systems can cause a poor image, or eyestrain, and eventual headache during use. The size of the prisms should be sufficient to utilize the entire aperture of the objective lenses; undersized prisms will cause "cut off" (decrease the effective aperture of the objective lens).

The above items were noted in CR's test of binoculars. In addition the binoculars were tested for actual magnification and field of view. The latter as given in the listings is the approximate width in feet of the actual view which can be seen through the binoculars at a distance of 1000 yards. The infinity setting, if present, was also checked for correctness. The various properties of the binoculars were considered satisfactory unless a note to the contrary appears in the listing. The binoculars included in the present test had the central-focus mechanism except as noted.

Prices are those obtaining at the time the binoculars were tested and are subject to variation because of the price policies of various dealers, who do not follow the fixed-price practices that are common in some other trades; prices may be partly determined by the location of the store and the type of competition to which it is subjected.

A. Recommended

Bausch and Lomb Zephyr 6x30; 7x50; Zephyr 9x35 (Bausch & Lomb Optical Co., Rochester, N. Y.) \$155, \$175, \$170, plus tax. The 7x50 glass had individual focusing and weighed 2 lb. without case. Eye distances, 8 mm., 12.5 mm., 12 mm., respectively. Field of view: 450, 370, and 370 ft. at 1000 yd. Zephyr 6x30 had a pit on left field lens and the right prism was "gray" (see text). ¶The Zephyr line is called Zephyr-Light in the Bausch & Lomb catalog. 3

Sard 7x50 (Kollsman Instrument Div. of Square D Co., Elmhurst, N. Y.) \$181.50, plus tax. Individual focus. Weight without case, 2.9 lb. (heaviest binoculars of those tested). Eye distance, 10.5 mm. Field of view: 370 ft. at 1000 yd. On one sample left prism has moisture film and there was lint on the field lens. A second sample of this glass gave good performance and had no defects. 3

Zeiss "Silvarex" 6x30; "Binocem" 7x50; "Deltrintem" 8x30 (Zeiss, Jena) \$125, \$175, \$135, plus tax. Weight of 7x50 glass without case, 1 lb. (lightest of 7x50 glasses tested). Eye distances, 11 mm., 12 mm., 10 mm. Field of view: 450, 370, and 420 ft. at 1000 yd. All had "gray" prisms (see text). Actual magnification of "Deltrintem" 8x30 was 7.7. 3

B. Intermediate

Asterette 7x35 (Believed to be from Toyoda factory, Japan) \$59.50, plus tax. Eye distance, 12 mm. Field of view: 370 ft. at 1000 yd. Hinge action, though good, was slightly uneven and prisms were too small, causing "cut off." 2

Habicht—DV 6x30 (Swarovsky Optics, Austria) About \$75, tax included. Double coated lenses. Eye distance,

13 mm. Field of view: 420 ft. at 1000 yd. One sample had a spot on the right objective and was out of collimation. On a second sample, the right objective was loose. Otherwise the three samples were comparable to the *Bausch and Lomb* binoculars. 2

C. Not Recommended

Emden 6x30 (Emden, Germany) \$49, plus tax. Eye distance, 11 mm. Field of view: 450 ft. at 1000 yd. Mechanical finish, fair; cover poorly cemented, resulting in poor appearance. Engraving, good. Hinge action, poor. Left objective loose. Prisms too small, causing "cut off." 1

Ofuna 7x50 (Ofuna, Japan) \$45, plus tax. Weight, 1.2 lb. Eye distance, 14.5 mm. Field of view: 370 ft. at 1000 yd. Mechanical finish and hinge action, fair. Engraving, poor. The right objective was loose, and the left one spotted. Had "gray" prisms which were too small, causing "cut off." 1

Vista 7x50 (Believed to be from Toyada factory, Japan) \$37.25, plus tax. Individual focus. Weight, 1.2 lb. Eye distance, 14.5 mm. Field of view: 370 ft. at 1000 yd. Mechanical finish, fair. Engraving, poor. Objectives loose, and the left objective was spotted. Lint on field lens. Diopter setting, infinity, was off by 1 diopter. Prisms too small, causing "cut off." Out of collimation. 1

Unidentified French 12x45 (Believed to be Deraisme, France) \$75, plus tax. Optics were not coated. Eye distance, 5 mm. Field of view: 260 ft. at 1000 yd. Had loose objective which in this case caused an unsatisfactory image because of high magnification. Engraving, poor. Dirt on field lens. 2

Note: It is expected that a substantial additional number of binoculars of English, German, French, and Swiss makes will be reported in a forthcoming *CONSUMERS' RESEARCH BULLETIN*. A number of opera and field glasses will be included.

How to Select a Piano

Editor's Note: Because of the large investment involved, and the fact that the consumer normally expects a piano to be almost a lifetime purchase, the problem of choosing the right piano is an important one to many persons. The accompanying brief article dealing with this problem is based on the observations and experience of a musician — a pianist who has worked for many years in his profession and is conversant with the field of musical instruments. Because pianos and other musical instruments do not lend themselves to usual methods of testing which permit objective and useful comparison of test results obtained under laboratory conditions, *CR* has followed the practice necessary and desirable in some special cases and has based this discussion on the advice of an expert who is known to be well informed and unbiased.

ANYONE planning to buy a piano should have certain details in mind that he will wish to investigate, either with or without professional advice. An experienced and competent pianist will be aware of these items and test any proposed instrument, grand or upright, along these lines. Assume that an upright piano is to be bought. Here are the basic qualities that should be checked:

1. **Tone.** Every piano salesman will exploit the tonal beauty of any instrument you look at. All manufacturers insist that here is a point where his product definitely outclasses the field. The fact is that most pianos have a relatively pleasant tone, especially when they are conditioned ready for sale. The layman will see small choice here, for this angle, played up favorably by the salesman, is almost sure to appear quite satisfactory to the layman's ear. How well the piano will sound after a considerable period of use is another matter. It is never safe to buy on the basis of initial tone quality alone. There are other important items to consider.

2. **Key resistance.** The key resistance or "touch weight" is defined as the load necessary to move the key downwards from its rest position, measured at a point about $\frac{1}{2}$ inch from the front edge of a natural key, with the sustaining pedal depressed. When you are informed that a certain instru-

ment has a "feather-weight touch," you may have doubts as to the advantage of this quality. If the instrument is to be bought for somebody who wants to play the piano, what is needed is an approximation to the touch of a grand piano. Grand pianos have a key resistance of about two ounces, or roughly 50 grams. (A resistance much under 50 grams is not satisfactory for building a pianist's technique.) Too light a touch means poor control of the tonal volume in playing.

3. **Key dip.** This should be $\frac{3}{8}$ of an inch. A shallow action of the keys is a handicap in playing. Likewise, a deeper dip than the standard is inadvisable.

4. **Repetition.** A professional pianist will probably test this point first. He will repeat the same note as rapidly as possible to ascertain its accurate response to the motion of the fingers. Without clear repetitions, a piano may be regarded as having an inferior action.

5. **Sustaining ability.** Play a single note and hold it. Listen to the tone as it dies away. This diminuendo should be gradual. If it is jerky, the voicing is not well adjusted. A deficiency in this respect is common, even in fine pianos. Try to find an instrument that sounds right in sustaining tones. Marked deviations from steady decrease of volume will be clear even to the untrained ear.

Ants — and Other Bugs — in the Pantry

IF THE THOUGHT of insects in association with food is revolting, the sight of them in food or in areas used for preparation and consumption of food is doubly abhorrent. Even though some of the insect species which share man's food have not been inculcated as transmitters of disease, and no one has bothered to find out if these creatures might not be sources of a supplementary supply of good protein, the presence of these uninvited guests is the signal for the householder to resort to chemical warfare.

There are a few fundamental principles involved in insect control in enclosures assigned to food preparation and consumption — it does not matter whether the situation is a kitchen in a private home, a ship's galley, a restaurant, or a specialized food preparation plant.

Warmth, moisture, places to hide, food, and inadequate sanitary procedures are all encouraging to insects. An inadequate sanitary procedure does not necessarily correspond to one's idea of lack of cleanliness; it may mean poor and neglected storage conditions, poor timing in cleaning, or an imperfect knowledge of the requirements in protection against insect infestation. The presence of the most modern kitchen equipment does not of itself assure adequate sanitation. The most up-to-date kitchen may harbor insects. The use of chemicals for insect control is a part of the sanitary procedure, but *it should be considered an adjunct, not the sole, means to the end.*



Saw-toothed grain beetle, about 20 times actual size. A brown beetle, about 1/8 inch long, that feeds on grain products and dried fruits.

There are certain laws, regulations, and inspection routines enforced by municipal and State Boards of Health, the U. S. Food and Drug Administration, and U.S.D.A. Bureau of Animal Industry, which cover the use of insecticides in areas in which food is prepared on a commercial basis for consumption by the public. Unless tolerances have been established, the most important concept of these regulations is this: *Anything present in food which is not necessary in its preparation shall be considered a contaminant.* Upon the finding of contamination, the processor and/or the contaminator are subject to fines and/or jail sentences as the

courts may rule. Thus insects or insect fragments are contamination and so are insecticidal chemicals if they are found in the food. Hearings by the Food and Drug Administration have been in progress in Washington for some time with a view to setting of tolerances on the newer insecticidal chemicals. However, until a tolerance for an insecticide in food, usually stated as so many parts of the contaminant to a million parts of food or beverage, has been established, it is considered that the permissible amount is zero.

Intelligent use of insecticidal chemicals presupposes that (a) you know the insect's identity, (b) you know how it lives and behaves, and (c) you know where it lives in your bailiwick.

No insecticidal chemical in general use today is specific against all insects. The form of the finished insecticides, the method of use, and the scope of the area treated are all important, and there is need for good judgment and discrimination on the part of the user. *The method used must include avoidance of contamination.* This often means removal of food, utensils, and equipment from the area during treatment or covering them with impervious covers.

The method of application must also take into consideration the hazards which the insecticide holds for the user. Acute (immediate) toxicities of the chemicals mentioned herein have been expressed as follows: In relation to DDT, which resulted in death of laboratory animals when 250 milligrams were administered for each kilogram of body weight, chlordan was half as toxic, the gamma isomer of benzene hexachloride (lindane) was two times as toxic, pyrethrins had one-sixth the toxicity; piperonyl butoxide one-fiftieth the toxicity, and N-propyl isome one-fortieth the toxicity. At this time, there appears to be much more to be learned concerning the *chronic* toxicities of these chemicals. Chronic toxicity is that which is gradually acquired through repeated exposures. Thus far in the analysis of chronic toxicities, it has been stated that chlordan is at least four times as toxic as DDT and lindane one-fourth as toxic.

It should be borne in mind that these figures apply to the chemical itself in whatever carriers were used in the laboratory tests. In the solutions which you may purchase, there will in all likelihood be different solvents, emulsifiers, diluents, or carriers. Many of these may in themselves produce ill effects. The hazard of an insecticide therefore is the hazard of the complete product that is to be used, which may vary, up or down, from the haz-

ards of the chemical itself. Another important consideration is the fact that some individuals have shown no ill effects from casual contact with insecticides; others exhibit a high degree of sensitivity to one or another of them.

Those who use insecticides professionally usually have, and know when to use, respirators, goggles, and impervious hat, coat, and gloves. The non-expert has no such facilities, and would not wish to equip with them if he could. His best and safest means for applying solutions will include the use of a can for holding the liquid, a paint brush, a mechanic's oiler with a 45-degree bend in the spout, and neoprene-covered canvas gloves to be worn throughout the time he is handling or applying the insecticide. In making applications in the home, *avoid the use of sprayers*. Manufacturers' labels, in addition to statements of composition, will carry cautionary notes concerning safe use of their products. Follow them carefully. The federal government and many states have set up authorities to protect the public in the matter of false labeling.

We believe that the householder should not use solutions whose labels show they contain more than 5% DDT, 2% chlordan, or 1% gamma isomer of benzene hexachloride (lindane). Water emulsions are to be preferred over oil solutions because of toxicities and fire hazards. In purchasing chlordan solutions, buy only those packed in glass. In any case when a dusting powder containing pyrethrins, pyrethrum A or B, piperonyl cyclonene, piperonyl butoxide, rotenone, or boric acid (singly or in combination) is employed, the use of a dust mask and goggles is essential because of the physical properties of the dust. The use of powders containing DDT, chlordan, lindane, or sodium fluoride is not recommended because of their chemical properties. One cardinal point in the use of powders in food preparation areas is that excess powders must be cleaned up or picked up with a vacuum cleaner and removed before the application can be considered completed.



American cockroach, about 2/3 actual size. A large chestnut-brown roach, having a body about 1-1/2 inches long.

Powders leave loose residues which can be picked up, blown about, swept, or jarred into places where they should not be. Insist that others who may be doing this work for you follow this rule. *Do not permit the fogging or vaporizing of any insecticidal material by any means unless food, utensils, work surfaces, and equipment are adequately covered.* It will be wise that you do not eat in a restaurant where this procedure is not scrupulously followed. Even if the services of a "pest control operator" are used, there is still the same need for

great care with respect to the possibility of contamination.

All of the chemicals mentioned in the acute toxicity listing will kill most of the insects one is likely to encounter in a food-processing area. There will be, however, differences in efficiencies, costs, and time required for original application and re-treatments when necessary.

Insects of stored foods: This group includes *confused flour beetle, saw-toothed grain beetle, Indian meal moth, chocolate moth, weevils*, and many others. Probably the most efficient chemical against this group will be DDT. If you see these insects on storage shelves, *remove stored packaged foods* from the area you intend to treat, vacuum clean or dust or wash down the surfaces. Using oil-can dispenser, squirt the insecticide into all cracks and crevices, and paint surfaces with the solution. When the solution has dried, return articles to storage. If you find insects in the food itself, remove and destroy the contaminated material and proceed as indicated. You must take care not to treat with chemicals *any surfaces which come into direct contact with food*. If you store flour or any other food in bins and it should be contaminated, destroy it, then thoroughly vacuum clean the inside of the container, paying particular attention to cracks and crevices.

Roaches: This group includes the German, American, and Oriental species, sometimes called waterbugs. **Ants:** Many species; those commonly encountered may include thief, pavement, carpenter, and Pharaoh's. Chlordan seems to be the most efficient chemical for control of these insects; lindane, too, may be used. Methods of application will be as described for DDT, by applying the insecticide to runways and areas frequented by ants or roaches and paying particular attention to cracks and crevices.

Pyrethrum solutions with or without synergists (substances used with and supporting the action of the base material) such as piperonyl butoxide or N-propyl isomer and pyrethrum powders with or without piperonyl cyclonene may be used for control of all the insects mentioned in the foregoing paragraph with the possible exception of Pharaoh's ant. The use of substances such as piperonyl butoxide and/or piperonyl cyclonene will increase the effectiveness of the pyrethrum residues. These pyrethrum-based insecticides will probably cost more and the effectiveness of their residues is apparently not so long-lasting as those of DDT and of chlordan; under certain conditions where high humidities and temperature prevail, the residual effect will certainly be of short duration. If pyrethrum powders are used, cover all food, utensils, and equipment, dust at least a 4-inch barrier band around the area you intend to treat, then treat every crack and crevice in the area. Pyre-

thrum is quick-acting, and insects will begin to come out of their hiding places almost at once. Sweep up dead insects and excess powder including the barrier band, then remove covers over food, tables, and utensils and/or return food to storage.

Flies: The following suggestions may help in the control of these insects. Paint window and door screens and interior surfaces of the sash with 5 percent DDT (avoid spreading and spattering of the material). If you have flies which are not killed by DDT, paint on 2 percent chlordane, or 1 percent lindane. Paint areas around garbage awaiting disposal. Garbage should be kept covered and disposed of every other day during hot weather. If you wish, after the last meal of the day, cover all food, dishes, other utensils, and all surfaces coming into direct contact with food, close windows, and release an aerosol bomb containing pyrethrum, with or without piperonyl butoxide or N-propyl isomer. Use dosage rate suggested by the manufacturer.

CR considers that the wisest policy will be not to use DDT or similar materials under any circumstances where they put a coating on walls, ceilings, floors, or woodwork. Cases have been reported



Pharaoh's ant (female), about 5 times actual size. A small orange-colored ant (the workers are less than 1/10 inch long) that feeds on fats and meats. It generally nests in the walls of houses.

where persons have been unable to continue living in rooms where DDT had been sprayed. It must be remembered that some persons have a very high sensitivity to some insecticides and may be affected by almost infinitesimally small doses. Furthermore, such application may result in dead flies dropping onto tables or into food utensils or food.

There is a possibility of damage being done by insecticides to materials in a house through staining, particularly if surfaces are painted dark green or red.

None of the suggestions made here is to be considered as suggested to contravene any local or state regulations. We do not believe you will find objection from health authorities on what has been outlined. However, anyone purveying food to the public, either in stores or restaurants, should advise his local public health officer of his intentions, and ascertain whether a permit is required.

Whether you apply insecticides yourself or contract for this work, and whatever procedure you may use in insect control, *do not become careless in handling or using these chemicals. There is no insecticide on the market today that is entirely free of hazards to all persons.* Make it a point to read labels closely, so as to become familiar with the kinds and percentages of insect-killing ingredients in the package.

Above all, be careful not to contaminate food or permit any practice to be followed as a result of which food contamination could occur at some later time.

Corrections and Emendations to Consumers' Research Monthly Bulletins

Three Automatic Dishwashers and Two Non-Automatic (Portable) Dishwashers
Page 7, Table II,
Oct. '50 Bulletin

Two figures in the last column indicating the cost to heat 1 gal. of water, in hundredths of a cent, using natural gas were calculated incorrectly. The corrected figures are: for automatic storage, 8; for tank with side arm coil (instantaneous), 16.

Bicycles
Page 18
Dec. '50 Bulletin

Change listing of Westfield from B. Intermediate to A. Recommended. According to information received from manufacturer, the difficulties with hardness of front axle cones have been corrected, and hardness now meets applicable requirements.

Conversion Gas Burners
Page 22, Col. 2
May '51 Bulletin

Change listing of Handley Brown Fuel Door Burner, Model 3FD-10-1, from C. Not Recommended to B. Intermediate. The last two sentences beginning at line 7 of the listing should also

be deleted, as the A.S.A. requirement given is not applicable to this type of burner.

Conversion Gas Burners (Combination)
Page 23
May '51 Bulletin

Since the May 1951 CONSUMERS' RESEARCH BULLETIN was prepared, the American Gas Association has begun to list combination burners that can be operated normally with manufactured or natural gas, and on liquefied petroleum gas as an alternate emergency fuel in case of failure of the regular gas supply. The first complete sentence at top of column 1 stating that such burners are not A.G.A.-approved should be deleted.

The Gordon "Spreader Flame" Dual Fuel Burner will now be given a rating of B. Intermediate, and the sentence in the listing beginning "As it is not listed by A.G.A. . . ." should be deleted.

Automobile Waxes and Polishes
Page 17, Col. 1
July '51 Bulletin

The address of the Dow Corning Corp. has been changed to 600 Fifth Ave., New York 20.

Crankcase Oil Additives

SOME of our readers will remember that the June 1950 CONSUMERS' RESEARCH BULLETIN carried an article discussing various crankcase oil additives. There were two that were not included in that article, but which have been investigated subsequently. These two are brands that have been the subject of a considerable number of inquiries from readers of CR BULLETINS, and the indications are that the promoters of both products are exerting a good deal of sales pressure at this time.

In view of this fact, it was thought wise to make a special study of Wynn's Friction Proofing Oil and Bardahl. Reliable evaluation of motor oils, and especially motor oils containing additives, as has been mentioned in an earlier BULLETIN, involves difficult laboratory techniques and the use of highly specialized apparatus.

The tests of Wynn's included determination of relative wear with a typical Mid-Continent motor oil as carried out on a standard Precision 4-ball wear tester, using Mid-Continent motor oil with 10 percent of Wynn's Friction Proofing Oil added, and straight Mid-Continent motor oil as a "control." This wear test is designed to determine the wear-prevention properties of oils under conditions that resemble conditions in an internal combustion engine. Three specially prepared steel balls are held in a fixed position. A fourth ball making contact with the fixed balls at a given pressure is rotated at a prescribed speed. All four of the balls are completely submerged in the lubricating oil to be tested. The temperature of the oil is maintained at a steady value throughout the test. The addition of Wynn's Friction Proofing Oil improved to a measurable extent the wear-prevention properties of the Mid-Continent oil, but the effect was not large.

A thin-film detergency test (oil flowing continually over steel heated to 500°F) was also conducted to obtain information as to how well the product would keep the engine clean. By cleanliness is meant freedom from varnish deposits on piston skirts and cylinder walls, and carbon deposits behind piston rings. In addition to furnishing information on the detergency properties of the lubricating oil, this test permits an evaluation as to the economy with which the lubricating oil can be used — i.e., consumption expectancy of the oil. In carrying out the thin-film detergency test, the addition of Wynn's Friction Proofing Oil was found to have increased motor cleanliness as compared to the straight oil, but the detergent properties were not such as could be classed as excellent. Wynn's was also found to have contributed to the suppression of varnish-forming deposits (materials which are naphtha-insoluble, but chloroform soluble). The addition of the additive may not be expected to contribute toward the lessening of carbonaceous deposits behind the rings, as the equivalent of these deposits in the tests was somewhat larger with the Wynn's oil than with the straight Mid-Continent oil.

The oil with and without Wynn's was subjected to the Sohio Corrosion Test (named after the Standard Oil Company of Ohio, a test having high repute in the industry for its value in judging the chemical stability of a lubricant and its tendency to resist chemical changes when

exposed in contact with catalysts to high temperatures and the oxidizing action of the air). The oil containing the additive had higher viscosities at the conclusion of the test (4020 units against 2380 and 142 against 126—at 100°F and 210°F, respectively), a higher Conradson carbon residue (5.6 against 4.5), a higher neutralization number (12.1 against 7.9), indicative of acidity in the oil, and formed a larger quantity of naphtha-insoluble material (8.1 against 5.8). All of these changes were of an unfavorable type. The pour point was not affected.

The additive-treated oil showed about twice as high a tendency to cause bearing corrosion as the unmodified Mid-Continent oil, and this tendency approached rather closely to the maximum tolerable limit.

The Underwood Test is another important test. It is useful in determining chemical stability of an oil under certain operating conditions. The oil is heated to a temperature of 325°F, and then sprayed under a pressure of 10 pounds per square inch onto bearing metals. In its dispersed state, the "atomized" oil is subjected to oxidation under atmospheric pressure at an elevated temperature. The oil droplets are allowed to coalesce and are returned to the sump of the apparatus to be reheated to 325°. This cycle is repeated over and over again for 20 hours, and at intervals of 5 hours samples of the oil are removed to determine viscosity at 100°F, viscosity at 130°F, viscosity at 210°F, Conradson carbon residue, ash content, neutralization number, corrosive action on bearing metals, percentage of naphtha-insoluble material, chloroform-soluble material of the naphtha-insoluble material, and chloroform-soluble material.

It is CR's opinion that the results do not indicate that Wynn's Friction Proofing Oil is a desirable additive for automobile lubrication, since the shortcomings of the oil as evidenced from changes indicative of decreased chemical stability of the base oil with addition of the additive have more than offset the benefits to be derived from its use.

In connection with the study of Wynn's Friction Proofing Oil, some of our readers will be interested in an analysis of the product. Its composition is estimated to be: lead tallow soap, 4%; chlorinated paraffin, 9%; petroleum spirits (kerosene), 87%. It is believed that the special chlorinated substance present is probably decyl chloride [$\text{CH}_3(\text{CH}_2)_9\text{CH}_2\text{Cl}$], which has a relatively low specific gravity and high boiling point. The lead soap and the chlorinated additive are for the purpose of producing extreme pressure properties in the oil.

The detailed findings and a discussion of their individual significance for all these tests would take far more space than can be allotted in this BULLETIN; suffice it to say that tests of the types used in CR's study of Wynn's and Bardahl are conducted in a number of nationally-known commercial and non-commercial laboratories for the regular evaluation of lubricating oils and lubricating-oil additives; large buyers and users of oil who have technical staffs and equipment would not consider purchasing additive oils in any quantity without conducting such studies as are reflected in this article.

Editor's Note: The accompanying discussion of two well-known additive oils is important to consumers — and to educators — in a number of respects besides its relation to the public demand for these two well-known products. CR's study provides a guide to a useful way of looking at products sold to the consumer where unusual or surprising claims are involved, or where a product may be made to have one or more properties that have strong advertising appeal, possibly at the expense of other more desirable but less dramatic or intriguing properties. It is well also to bear in mind that if a lubricating oil needed the properties which are claimed for Bardahl and Wynn's Friction Proofing Oil, the largest refiners of lubricating oil for automotive use, who have excellent, professionally-staffed research and development departments and laboratories, would be almost certainly providing them in their regular automobile oils, especially now that "premium," extra-priced oils have become popular and are accepted by millions of consumers.

The consumer will be wise to recall that with respect to almost any chemical specialty, and especially perhaps with regard to materials offered for the use of motorists, an attitude of caution is always advisable; that in many instances, probably in most, the product will not provide the special values that its makers claim. More important is the fact that often, along with the claimed advantages, there will go disadvantages or drawbacks of an important sort, so that there may be no net gain, or the net effect of using the material may be negative rather than helpful.

The best general rule is that when a product is offered to you with persuasive advertising which makes special claims for quality or unusual characteristics, or is sold by interesting and appealing "demonstrations," and the product is one where technical questions are obviously involved (as they would be with a specially high-priced motor oil, or a motor oil additive), it is wise for the consumer who does not have qualified sources of technical information at his disposal to take the position that he is not interested in a product unless and until the promoter's claims are supported by proof, in the form of detailed, signed reports of technical tests conducted by engineers, physicists, or chemists of skill and competence in the field of science or technology in question. If a report is furnished for examination, be sure it proves the points claimed; that it is not merely an assertion that the product lacks certain harmful properties (the layman would be unable to determine whether what the manufacturer furnished in the way of proof regarding absence of harmful substances was definitive or not).

Automobile manufacturers recognize the special problem introduced by the use of oil additives. One 1951 Owner's Manual says: "Special 'break-in' oils are unnecessary. They should not be used under any circumstances unless the manufacturer can furnish satisfactory proof that the compound contains no harmful substances."

Another manual says, "Special break-in oils and oil 'dopes' are not necessary and the factory cannot assume responsibility for damage that may occur if they are used. Compounding an engine oil involves careful selection, blending and balancing of mineral oil stocks and, in the case of most premium oils, the selection of a combination of the most effective 'additives' for the base stocks used. It is unlikely that any liquid sold separately will be equally beneficial to all brands of mineral oil."

Still a third leading automobile manufacturer takes an equally strong position against crankcase oil additives and advises consumers to use oils whose compounds have been blended in by the manufacturer.

These three brief citations will indicate the car manufacturers' attitude on the question and the reasons for their thinking that the products of manufacturers of chemical oil specialties do not belong in the lubricating oils for their engines.

It is important to bear in mind that the properties that may make for a convincing demonstration of the sort which dealers handling oil additives often present to prospective filling station and garage customers are not necessarily advantageous in the use to which the product is actually put. An additive, for instance, that may improve the characteristics of an oil to diminish wear of parts under high-pressure contact may very likely have a tendency to increase oxidation and sludge-forming characteristics of the oil; will also possibly increase its corrosive effect on the bearings. The straight Mid-Continent oil showed only a very limited tendency to cause corrosion of bearing mate-

rials, whereas with the oil containing the Wynn's additive, the corrosion tendency was rather pronounced, in so far as cadmium-silver bearings were concerned.

In connection with the above findings, it will be of interest to study briefly the claims made for Wynn's, which are rather typical of the sort of claims made for a considerable number of oil additives. Promotional literature claimed lubrication that "reduces friction, increases horsepower, prevents corrosion, keeps engine clean! reduces wear, cuts down repair bills. . . squeezes into the very pores of metals, forming an indestructible film of lubrication that is literally part of the metal itself! This film virtually

eliminates friction, heat and wear caused by metal moving against metal. . . prevents the formation of deposits of carbon, gums, and sludges. . . your motor will start easier in summer or winter. It'll run smoother and cooler. Give better mileage. You'll FEEL the extra 'pick-up'. . . ends "sticky" valves and rings. Softens and removes carbon in cylinder head. Reduces motor 'ping'. . ."

With respect to any product that is claimed to remove valve-sticking troubles, it should be pointed out that while any of a considerable range of oil-additive mixtures could give a favorable result, the *continued* use of such a product could give rise to operating difficulties when applied to equipment which does not require lubricating oil possessing the highly developed detergent properties that are present in some of the additives (for these properties, see the article on additive oils in the June 1950 CONSUMERS' RESEARCH BULLETIN). The right solution for this type of problem is, after the valve-sticking difficulty has been corrected, to choose and use a regular crankcase oil that experience has shown is not likely to contribute to valve sticking or other evidences of gum deposits on the particular make of car which is involved. The dealer in the make of car in question can give the motorist the best sort of information on an oil for regular use that will not present this difficulty, or if he is not in a position to advise on this point, it will be wise to write the engineering department of the maker of your car, at the factory address, rather than to take the opinion of a dealer promoting a particular brand of special top-lubricant or other oil to be added to the regular oil in the crankcase.

On the oil additive *Bardahl*, the Underwood Test was used. There was a very large increase after a 20-hour run, in the Conradson carbon residue (0.48 to 3.1), neutralization number (0.25 to 7.1), and viscosity at 210°F (58 to 86), in the crankcase oil to which *Bardahl* had been added. (All of these effects were of an undesirable nature.) There was a large quantity of naphtha-insoluble material formed, and a rather extensive loss in weight of the cadmium-silver bearing used to evaluate the corrosive tendencies of the oil. The corrosive action on a copper-lead bearing in the test was also pronounced. The same general results were found by the work of two different laboratories. One, for instance, reported a loss of 8.7 mg. per square inch of a copper-lead bearing in 48 hours at 300°F with *Bardahl*. The loss was zero with a straight motor oil to which *Bardahl* had not been added. The same result followed a test for 96 hours at 250°. The loss of cadmium-silver bearing material in 48 hours at 300° was 1.7 mg. for *Bardahl* in the straight motor oil and less than 1/3 of that for the oil without *Bardahl*. By way of contrast, labeling on the *Bardahl* can claimed that "*Bardahl* is guaranteed free of harmful ingredients to bearings made of babbit, bronze, brass, steel, cadmium, copper alloy, or wood." As to the claims for friction reduction, the coefficient of friction was found to be about the same for the straight motor oil as it was with 10 percent *Bardahl* in that motor oil, with the Timken Wear and Lubricant Tester. (The difference was small, but the friction coefficient was a little higher with the *Bardahl* in the oil.)

The poor stability against oxidation imparted to the oil by the addition of *Bardahl* would appear to be a sufficient reason for not recommending that product.

It is important for consumers to bear in mind in considering any and all of these additive products that it is

not difficult to provide an additive which will give some selected performance characteristic to a high degree. Most laymen will not recall that an oil has to perform *several functions* and meet a considerable number of requirements while serving as a lubricant in an internal combustion engine, and an oil, to be good, must therefore be shown by laboratory bench tests to possess *all* of the necessary performance properties required of a good lubricating oil, and it should be free from all undesirable or harmful properties. To repeat, it is not enough for oil to have one or more properties highly developed *unless it is certain that one or several undesirable properties have not been introduced or increased at the expense of the improvement of one or more selected characteristics.*

On *Bardahl*, as on Wynn's, claims were broad in scope and similarly unsupported in the advertising leaflets and literature examined by CR by evidence in the form of tests carried out by reputable and qualified testing laboratories. Some of the *Bardahl* claims were: "will Double your Engine Life. . . it acts as an anti-oxidant, reducing the tendency of oil to form so-called by-products and sludge. *Keeps the oil cleaner.* . . . reducing friction by 75%, *cutting friction wear in half.* . . valves, piston rings, cylinder walls and bearings, etc., will last twice as long when BARD AHL is added at each oil change. Internal combustion engines will operate with 10% more efficiency, saving 10% fuel. . . The lubricating oil may be used up to twice as long with 10% BARD AHL added. . . It contains no ingredients harmful to metal. It protects lubricating surfaces from pitting and etching by acids formed by internal combustion engines." One gets the impression that promoters of products of this general sort have a tendency to select their claims, not on the basis of what they know from laboratory or field tests conducted by qualified experts, but upon the basis of the ideas they consider to offer the most persuasive appeal to prospective customers. Certainly no additive is known, or in our opinion likely to become available, that will do all or any considerable part of the things claimed for typical oil "specialties." In some cases, indeed, the test findings on products of this sort indicated that the opposite of the claim made would be more nearly true.

On a cost basis, it is interesting to note that with the use of *Bardahl* in the recommended proportion, the cost of filling the crankcase of the usual car will be about 25 percent more than when premium oil is used or 50 percent more than when non-premium oil is used. It is our opinion that 100 percent of a good oil will be better for the engine than 4½ quarts of lubricating oil, plus a pint of *Bardahl* at 87 cents.

Analysis of the *Bardahl* product indicated the presence of lubricating oil, carbon tetrachloride or ethylene dichloride (7.5%), and lead naphthenate (5%), plus small amounts of additives containing tin and phosphorus. Chemicals of the type of carbon tetrachloride and ethylene dichloride are not desirable substances to introduce into the interior of a gasoline engine. The reason for using such a material in an oil additive is quite likely its very high film strength, which gives it a strikingly favorable performance in the type of demonstrating device for lubricants rather widely used by additive oil salesmen. (It should be borne in mind that such demonstrating devices are not real testing units; they do not afford a test of a sort that would be used by a qualified testing laboratory, but are used to persuade the observer that the material

being offered is of outstanding value in some one or two respects. The fallacy of this approach has been pointed out in this article.)

According to a treatment of lubricating oil additives published by The Texas Company in their house organ *Lubrication* (January 1946), a number of different types of compounds are used to increase the load-carrying properties of lubricants, including compounds containing active sulfur, phosphorus, or nitrogen; and sulfur compounds, as well as chlorinated materials. In addition to compounds containing phosphorus, sulfur, and chlorine, lead soaps, such as lead naphthenate, are used to impart extreme pressure properties.

Along with the high film strength of the halogenated hydrocarbons goes a very disadvantageous characteristic; namely, that in the presence of water and water vapor, and during combustion, breakdown products liberated are highly corrosive. The corrosion tendency is so marked, indeed, that manufacturers of carbon-tetrachloride fire extinguishers have had the utmost difficulty in producing extinguishers that would stand up over a period of years unused without failure of internal parts caused by corrosion. Avoidance of corrosion in an engine is desirable; a recent technical journal item noted that service station records indicate that 60 percent of automotive engine wear can be attributed to corrosion.

Manufacturers of additive oils appear to be unaware of the customary methods of investigation in their field — at least they do not supply relevant and competent laboratory data in support of their strongly worded claims, which, if actually true, should be *provable* by tests that can be carried out in a number of qualified oil-testing laboratories very readily. (A laboratory report of some sort often appears with the advertising material, heavily diluted by perhaps a score or even 50 "testimonials from satisfied users," but the laboratory report shown is usually of a kind that has no particular bearing on the questions involved, or it does not address itself directly to the claims made or to the element of *economy* in use of the material. Fulfilling its function *economically* is, of course, always an element in a proper judgment of any such product as such a judgment would be reached by a competent technical expert.)

* * *

During the time this article was being prepared, there came to our attention an interesting report from the State Laboratories Department, Oil Inspection Division, State of North Dakota, Bismarck, North Dakota, in which there are brief comments on a number of the well-known oil additives published for the benefit of North Dakota consumers, and the general comments of the director of this laboratory, which are given in part below, are very pertinent to this discussion:

Advertising material covering these products [to be added to the lubricating oil or to the gasoline in an automobile or truck] include various claims for improved performance, decreased maintenance, increased power, etc. In fact the claims are so numerous and exaggerated in many instances that the wise purchaser regards them with suspicion. This would seem to be indicated by the number of inquiries sent in to these laboratories. . .

The fact that tests cannot be readily made on a product of this nature makes it easier for the manufacturer to keep his product on the market. For instance this is exemplified in the continued offering of the so-called "gas savers" to the motorists of the country. It appears that a great many motorists are prone to experiment with the application of compounds and gadgets to their cars. In many cases this is done even though the car is functioning properly. If a motor has become improperly adjusted it is possible that the addition of a gadget may result in a compensation in adjustment. On the other hand since tests made by the motorist himself on his own car are not made in a scientific manner and since the experimenter is often oblivious to a great number of factors that should be considered, results indicating improvement may be imaginary or misleading.

With respect to oil and gasoline additives on the market it is difficult to believe that any benefit can be derived from the use of many of them *beyond the benefit that can be derived from the addition of a like quantity of a good oil.* [Italics by CR.] The price one pays for these products, however, is greatly in excess of that paid for a good oil. [In the ratio of about \$1.70 to \$0.25 or \$0.30 per quart, depending on the brand.] While these additives in general may not be expected to do any particular harm to the motor, the user is only losing money in many instances by using them. . . .

For many years it has been well known in the field of petroleum and automotive engineering that certain chemical compounds will impart increased load-carrying capacity to the lubricant. Lead naphthenate and free sulfur are very effective in this respect. They have found their place in extreme pressure lubricants including hypoid gear lubricants. Two of the products which were examined in our laboratories contained organic lead salts, apparently lead naphthenate. Whether or not it is necessary to add to the crankcase a compound to increase load capacity is questionable. The automotive engineer is better qualified to determine this as he has designed the bearings, etc., of the motor to stand up under refined petroleum oils of recommended viscosities. *One important fact to consider in respect to the various addition compounds, except possibly for those which have detergent or viscosity stabilizing qualities, is the lack of information in the technical literature on the subject which would point to the necessity for adding products of this nature to crankcase oil or to gasoline.* [The emphasis has been added by Consumers' Research.]

This report is given only with the aim of cautioning the consuming public in regard to the purchase of compounds to add to gasoline and lubricating oil. The prospective buyer will do well to determine first of all whether or not his motor needs the treatment claimed in advertising covering these products. Is he qualified to determine whether or not the product does what is claimed for it in its advertising if he uses it? Will it do anything claimed for it that good oil will not do?

The proprietary brands of additive oil reported to the North Dakota bulletin were *Bardahl*, *Casile*, *Marvel Mystery Oil*, *Miracle Power*, *Pyroil B*, *Shaler Rislane*, *Si-Eu-Tif-Ik*, and *Wynn's Friction Proofing Oil*. Copies of the State Laboratories Department Bulletin No. 92 will be available from the Oil Inspection Division, Bismarck, North Dakota, for out-of-state applicants at \$1 per copy. (A money order, or postage stamps in small denominations, are accepted in payment.)

Barometers for Home Use

The Problem of Weather Forecasting

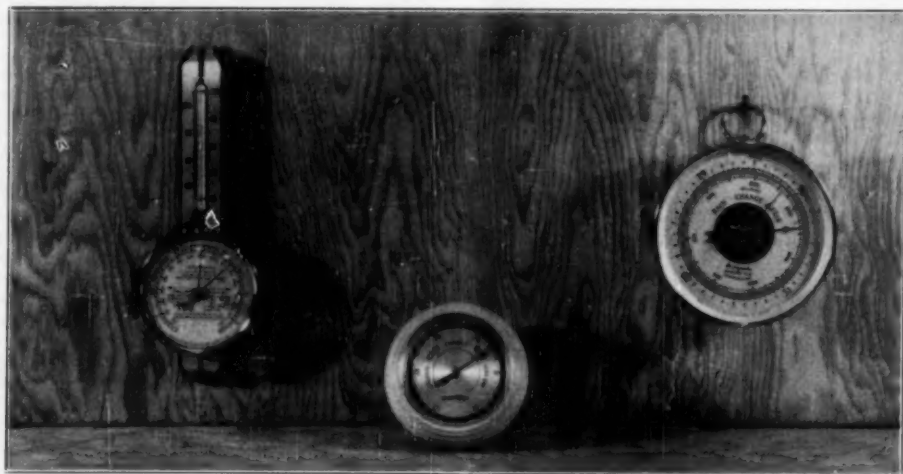
Those who rely upon weather reports from the radio or newspapers to aid them in planning ventures that depend upon the trend of the weather, often find that a forecast of rain on a particular day, for example, proves incorrect if the region is some distance from the weather bureau station. There is a good deal of uncertainty in all forecasts, even when the most refined techniques are used and all the other necessary data are at hand.

Many believe that the barometers used in the home (generally of far less accuracy than those used at weather stations) are useful for predicting local weather trends; however, forecasts using a barometer as the only guide *can not be relied upon* to forecast weather conditions. Forecasts are not made merely by observing the barometric pressure and consequently the words "stormy," "change," and "fair" found on some barometers are misleading; it is possible, of course, to have stormy weather when the needle points to "fair" or no rain when the needle points to "rain." More important is the *direction of movement* of the indicating hand. If the hand moves clockwise, the barometer is rising, often indicating the approach of fair weather. If the position of the hand does not change, it is often to be expected that the existing weather conditions will continue. If the hand moves counterclockwise ("to the left"), the barometer is said to be falling; this will often be an indication of stormy

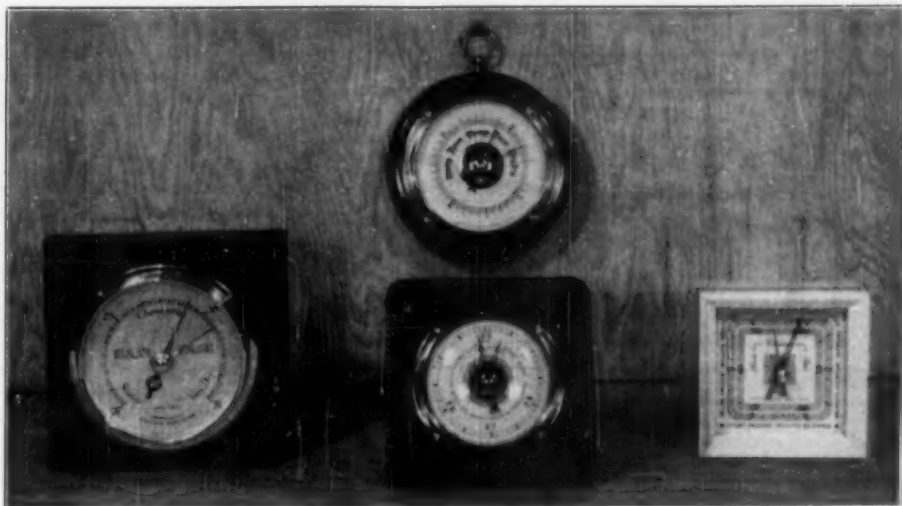
weather in prospect. Although a rapid fall of pressure shown on an aneroid barometer, if continued for several hours, will probably be followed by stormy weather, the actual significance of a rise or fall of barometric pressure considered without respect to other circumstances, is uncertain, in weather forecasting.

Even a satisfactory beginning in reliable weather forecasting requires in addition to barometric pressure, a great deal more technical information such as kind, amount, and height of cloud formations, wind direction and velocity, humidity, temperature, and the general weather conditions of the area. Above all, these require interpretation by trained observers, being influenced by whether the pressure is rising or falling, how *rapidly* the change is taking place, and by variations in the above data for a period of at least 48 hours before as well as a knowledge of weather patterns of previous years for the area, the surrounding terrain, and any typical seasonal changes.

In spite of there being so many influencing factors, a good aneroid barometer can be useful and one can with experience by noting roughly the other factors, learn to interpret coming local weather conditions with *some* degree of reliability, covering a period of a few hours in most cases. For a more detailed discussion see the Weather Bureau Bulletin No. 42, Weather Forecasting, available from the Superintendent of Documents, U. S. Govt. Printing Office, Washington 25, D.C., for 15c.



Left to right: Pend Barometer-Thermometer; Santo Domingo; Airguide Marine Barometer No. 211-B.



Top row: Airguide Forecaster No. 210.

Bottom row: Tel-Tru; Airguide Windsor No. 224; Taylor Travis Baroguide No. 2489.

Aneroid Barometers as Altimeters

Barometers are a quite sensitive means for measuring differences in elevation occurring within a short space of time. A form of aneroid barometer known as an altimeter is widely used on airplanes to determine changes in altitude in flight, and have become a popular gadget on automobiles for indicating substantial changes in altitude in hilly or mountainous country.

Construction and Use of Aneroid Barometers

The aneroid barometer consists essentially of a small plastic, wooden, leather, or metal covered box containing a pressure-responsive chamber and motion-multiplying lever system, and with a pointer moving over a graduated dial. The range of atmospheric pressure is usually from 24 to 32 inches of mercury. The pressure-sensitive device is a vacuum box, usually made of flexible corrugated sheets of metal under partial vacuum, which are kept from collapsing by a strong steel spring. As the atmospheric pressure outside the box increases, the corrugated surfaces approach each other slightly, and return again to their previous relative position (move away from each other) when the pressure decreases. See Figure 1.

In using a barometer of this type, it is necessary, in order to compare roughly the readings obtained with those reported on weather maps, to correct the instrument for the height above sea level at which it is being used so that it gives readings "corrected to

sea level" rather than the actual pressure at the location. The Weather Bureau's barometric readings are corrected to sea level in order to have a standard basis for comparison of pressures in various areas at different elevations. These corrections are not made by a single approximate adjustment, which would be satisfactory for the home observer, but by means of carefully computed correction tables supplied by the central office for the specific location of the field station, including even the small additional corrections due to temperature and other meteorological factors which vary from day to day. In large cities where the U. S. Weather Bureau has an office, the reading corrected to sea level can be obtained and used as a single approximate correction if the Weather Bureau station and the observer's home are at about the same level. (If not at the same level, a correction must be made for the difference in level.) The barometer is set to the proper reading corrected to sea level for the altitude at which it is used, usually by means of an adjusting screw located at the back of the instrument. If a weather Bureau reading is not available, a satisfactory correction for practical purposes may be made by use of a table sometimes found in the instructions that commonly accompany a barometer, or by adding one inch per 1000 feet of elevation, which is a satisfactory approximation up to 10,000 feet of elevation. However, a reading obtained from the Weather Bureau station is desirable in that it eliminates the error arising from incorrect adjustment of the aneroid by the manufacturer.

The most useful readings are obtained by tapping

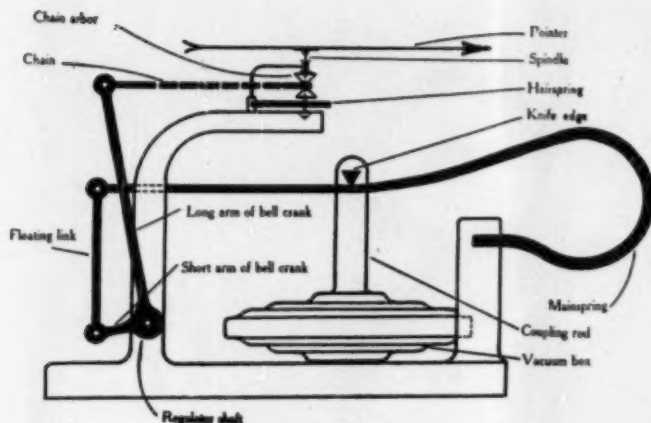


Figure 1 — Mechanism of aneroid barometer.

the glass of the dial, and observing the resulting direction of motion of the indicating hand (this helps in determining whether the atmospheric pressure is rising or falling). Since the change in pressure and the resulting movement of the indicating hand is usually relatively small (normally between 29.5 and 30.5 inches of mercury for locations near sea level), a marking hand, which can be moved at will but which does not change its position with changes in atmospheric pressure, is helpful. With the aid of the marking hand, usually adjusted by turning a knob located in the center of the dial, the observer can readily determine the direction and amount of the change that has occurred since the last setting of the marking hand. In order to observe the direction of current changes in pressure, the marking hand should be reset fairly frequently, say in the morning and evening. The passage of a storm may be accompanied by a change of one-half an inch or more in the reading.

The location for a barometer used in the home should be selected so that the instrument will not be subjected to extremes of temperature; it should not be exposed to the direct rays of the sun, since aneroid barometers can show considerable errors when the temperature is far from normal. Devices for correcting the temperature errors in the instrument are only approximate at best. The aneroid is not a permanently dependable indicator of barometric pressure because there are errors, constantly increasing, that arise from gradual changes in the internal structure or temper of the metal diaphragm. An aneroid barometer is also susceptible to damage by sharp jolts or knocks which may introduce errors due to changes in stress or shifts of position of various links and levers inside the case.

Tests and Results

In CR's tests of seven aneroid barometers, the instruments, after being corrected for elevation of the place of observation, were compared with a mercurial barometer, and readings were checked on several different days. They were also placed, two at a time, in a sealed pressure chamber at 29.64 inches of mercury, and the pressure inside was varied from +1 to -1 inch of mercury around the arbitrary figure of 29.64 by a pressure-suction pump, controlled by venting valves; the resulting errors of the aneroids were observed through two glass portals in the chamber. They were all examined for relative readabil-

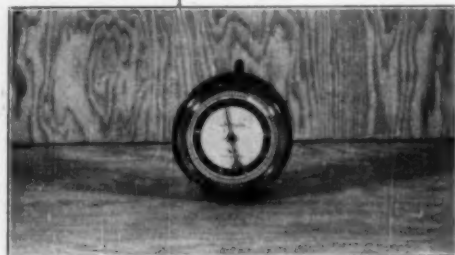
ity, and for stability on tapping.

With the altimeter, also included in this test, the test method was similar, but the atmospheric pressure was varied to simulate altitudes up to 15,000 feet.

Helpful directions accompanied all the barometers except the *Tel-Tru*. All those accompanied by instructions had charts for correction to sea level except the *Taylor Baroguide* (which had a dial graduated in feet on the back, designed to produce the necessary correction when turned to the altitude of the location), and the *Santo Domingo*.

The dials of the barometers were marked in inches of mercury and graduated in 1/10 inch except the *Airguide Marine* and *Airguide Forecaster*, which were marked at each tenth of an inch and had 1/50-inch graduations, and the *Taylor Baroguide* which was marked in inches of mercury and had 2/10-inch graduations.

Prices are those paid at time of purchase. All instruments were equipped with a "marking hand." Only two of the barometers tested claimed to be temperature-compensated. These were the *Air-*



Auto Altimeter No. 2068F.

guide Marine and the *Tel-Tru*. Ratings are based mainly upon ability of the barometers to give readings to an accuracy within 1/10 inch of mercury.

Barometers

A. Recommended

Pend Barometer-Thermometer (Swift & Anderson, Inc., 111 Summer St., Boston 10) \$8.50. Chrome and black plastic case with circular dial, wall type. Millibar graduations are provided. Alcohol thermometer with readings from 30°F to 110°F also attached. One dial marking incorrect; 31.5 was actually 31.6. Readability, fairly good; stability on tapping, fair. Accuracy, very good. 2

Airguide Marine, No. 211-B (Fee & Stemwedel, Inc., 2210 Wabansia Ave., Chicago 47) \$14. Chrome metal case with circular dial, wall type. Millibar graduations are provided. Readability, good; stability on tapping, good. Accuracy, very good. Marking hand worked stiffly. 3

B. Intermediate

Santo Domingo (Made in Germany; sole importers, J. M. Santo Domingo & Co., Inc., 10 Rockefeller Plaza, New York 20) \$2.88. Painted metal case with circular dial, suitable for wall or desk use. Readability of pointer on dial, fairly good; stability on tapping, fair. Accuracy, good. 1

Airguide Forecaster, No. 210 (Fee & Stemwedel, Inc.) \$9. Mahogany case with brass encased circular dial, wall type. Readability, very good; stability on tapping, good. Accuracy, fair. 2

Taylor Travis Baroguide, No. 2489 (Taylor Instrument Co., Rochester, N. Y.) \$9. Light plastic case with rectangular dial, desk type. Readability, fair; stability on tapping, good. Accuracy, good, but the altitude adjustment to be used (see text) did not produce correct reading. 2

Tel-Tru (Made in England for Germanow-Simon Co., Rochester, N. Y.) \$12.50. Mahogany case with circular dial, suitable for wall or desk use. Readability, good; stability on tapping, good. Accuracy, fair. 3

C. Not Recommended

Airguide Windsor, No. 224 (Fee & Stemwedel, Inc.) \$12. Leather-covered case with circular dial. Accuracy, poorest of barometers tested. Marking hand worked too stiffly. 3

Altimeter

B. Intermediate

Auto Altimeter, No. 2068F (Taylor Instrument Co., Rochester, N. Y.) \$12. Plastic case with circular dial, graduated in 200-ft. divisions from -1000 ft. to +15,000 ft. Readability, good; construction, good. Equipped with clamping device for fastening to windshield moulding of car. This model is especially suited for use in high mountain regions. Two other models are available, which have altitude ranges from -500 to +5000 ft. and -1000 to +10,000 ft. Accuracy, fair under controlled conditions of temperature and atmospheric pressure.

* * *

Note: Determining the accuracy of a number of aneroid barometers by calibration against a good mercurial barometer would be a project suitable for students in a physics or general science class, as it would help them understand the problem of the errors that afflict all measuring instruments, and the uncertainties that arise from failure of an instrument to repeat its readings exactly on successive determinations. A study of unreliability of the weather markings on aneroid barometers as checked by a careful recording of day-to-day weather conditions will help them understand, too, that what is printed, even on a measuring device, may be a long way from the practical working truth that people can depend on in planning their work and recreation.

Off the Editor's Chest

(Continued from page 2)

December 1950 the price of that rug was \$179.50, and in June 1951, \$193.50. It is not surprising therefore that "price resistance," as the trade calls it, has been strong.

Another explanation for the dearth of customers was that consumers just don't have the money to spend because there has been a great deal more unemployment than is realized. The various controls

designed to shift the nation's production from a peacetime basis to a partial war economy have disrupted the functioning of many individual plants and thrown people out of work. High taxes have also been a factor in draining off what some official propagandists are pleased to refer to as "excess purchasing power."

As for those consumers who have money to spend,

they are apparently buying with caution and selectivity. As a rule, merchandisers have found that when good values were offered, sales were active. When beef is too high, homemakers serve chicken and fish. Clothes already in hand are being made to do. The truth is that consumers in the United States are by and large and on the whole, in general and on an average, so plentifully supplied with worldly goods compared with any other country in the world that they can stop buying everything except the bare essentials and still live well enough.

The American economy, however, is geared to large-scale mass production of an almost infinite variety of goods and services, and the production line can only function successfully if the abundant stream of products that it is capable of turning out

is carried away into consumption. With warehouses full, it looks as if the entire economic machine will be slowed down until consumers are offered more and better bargains or what seem to be bargains by comparison with recent price levels. Whether they have decided to wait and see or whether they do not have the money to spend, consumers have obviously and sensibly concluded that their interests are not served by the patent-medicine economics of government price controls with all the costly red tape required of merchants, manufacturers, and processors, not to mention the increase in personal taxes called for to support new and ever-burgeoning government bureaus, commissions, and administrators. After trying one bottle of "snake oil" and discovering that it didn't work, consumers apparently were not rushing out to buy a second bottle.

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*Indicates that listings of names or brands are included.

Photographic Filters

THE PURPOSE of a photographic filter is to absorb in part or entirely the light of certain colors from the beam of light that forms the image. Light energy emitted by incandescent sources, such as the sun or the filament of an incandescent electric lamp, produces a substantially continuous spectrum of all visible wave lengths and some invisible ultraviolet and infra-red; such light customarily is considered to be "white." Actually, of course, the color of this "white" light varies considerably with the proportions of light of various wave lengths present.

The visible spectrum extends approximately from 400 millimicrons (blue-violet) to 700 millimicrons (red). All photographic emulsions are sensitive to some extent to invisible ultraviolet radiation of wave lengths that are shorter than 400 millimicrons, but the range of wave lengths that they can record varies widely with the type of sensitization. The so-called color-blind emulsions (e.g., positive film and film used for document reproduction) have little sensitivity to light beyond the blue; orthochromatic emulsions (e.g., *Verichrome*) are sensitive to light through the green; panchromatic emulsions (e.g., *Super XX* or *Plus X*) cover the range through the visible red wave lengths; infra-red-sensitive emulsions are sensitive to a range from ultraviolet through blue and to a second range including some visible red and infra-red to between 850 and 900 millimicrons, but have little sensitivity to green and yellow.

The optical glasses of which photographic lenses are made are strongly absorptive of the shorter-wave ultraviolet, and substantially opaque to radiation of wave lengths shorter than about 320 millimicrons; some optical glasses pass little or no radiation of even longer wave lengths in the ultraviolet which approach the wave length of visible blue. In this way the lens itself acts as a filter.

The principle in using a filter is that a color is lightened (produces a lighter gray in the print) by use of a filter of the same color, and conversely a filter of a complementary color produces a darker gray in the print. (There are exceptions, because a color that is visually like that of the filter may in fact be a mixture of colors, some of which are absorbed while others are transmitted by the filter.) A filter may thus be used as a *contrast* filter, either to lighten or to darken a color relative to others. For example, if a graph is drawn in black ink on cross-section paper ruled in blue, the blue lines can be eliminated from the photographic copy (rendered as though white) by use of a blue filter, and can be

darkened by use of a light yellow filter, or made black by use of a red filter.

The principal use of a filter in general amateur photography is to remove some of the blue light to which all photographic emulsions are more sensitive than is the eye, and thereby to produce a more natural appearance of the scene. The relative visual brightnesses of colors obviously cannot be correctly reproduced by a monochromatic (black, gray, and white) rendering on an emulsion that is quite insensitive to red, but some improvement can be made. For this purpose, a medium yellow filter such as the *Wratten K2* or its equivalent is useful; it absorbs all the ultraviolet and a considerable portion of the blue light, and its transmittance increases progressively through the green, reaching a maximum in the yellow. The *K2* therefore may be used with either orthochromatic or panchromatic emulsions; it is the most useful general-purpose filter.

When panchromatic emulsions are used, it is sometimes desirable to reduce the intensity of both the blue and the red light; then a light green filter is used. There is, of course, no point in using a green filter with an orthochromatic emulsion that is insensitive to red. For most accurate monochromatic rendering of color values, the Eastman Kodak Company recommends use of the *K2* filter in daylight with *Type B* panchromatic materials, and the light green *X1* in tungsten light, because that light is richer in red than is daylight. For *Type C* film, which has higher sensitivity to red than *Type B* film, the *X1* filter is recommended for use in daylight, and the deeper green *X2* for tungsten light.

If stronger absorption of blue is required than is obtainable with the yellow filter, an orange filter such as the *Wratten G* may be used (with either orthochromatic or panchromatic emulsions). Its use results in rendering the blues too dark in relation to the other colors, as compared with the visual appearance; this is called *overcorrection*. Greater overcorrection may be obtained by use of a red filter, as in the scenes in which a bright blue sky is made to look as if obscured by heavy thunder clouds.

Many amateur photographers find that a medium-yellow filter meets all their requirements. Others like to use orange or red filters to produce the so-called "dramatic" effect of a darkened sky, or a blue filter to produce the appearance of mist or fog, but these are for the amateur whose photographic interests are more or less specialized.

Because a filter absorbs some of the available, photographically useful light, a longer exposure is required than would be required if the filter were not used. The factor by which the unfiltered exposure should be multiplied to produce a negative of approximately the same density on the same emulsion under the same light is known as the *filter factor*. The factor for a specific filter varies with the emulsion used and the light under which it is exposed. No great precision is required in the filter factor, except in special applications such as making color separation negatives of identical contrast scale; the values stated by the manufacturer of the sensitive material are close enough. The filter factor may be quite different, however, for a fluorescent lamp than for a visually similar incandescent light source; in such a case, it must be established by actual trial.

Film for natural color rendition is designed to be used with light of a specific color characteristic or balance of colors, and a filter such as those used for monochromatic photography would produce an over-all cast of its own color. Artificial light has more yellow and red than daylight, while daylight is strong in the blue; thus makers of color film supply bluish conversion filters to permit use with tungsten light of film balanced for daylight, and yellowish filters to permit use with daylight of film balanced for tungsten light. They also supply haze filters to remove some of the bluish haze in outdoor scenes, and compensating filters of various tints and densities to compensate for light conditions different from that for which the film is balanced.

The simplest, and in some respects the best, form of filter is a colored gelatin film. This may be used in a holder on the front of the lens, or may be placed permanently between the lens components. The latter method often is used by amateur photographers who use their cameras only for pictorial work. A filter becomes part of the optical system of the camera, and its quality is therefore as important as that of the lens. A gelatin film is so thin that it is unlikely to introduce distortion. A filter of appreciable thickness, however, which may consist of a single glass disk of appropriate color, or of two glass disks with the color-bearing material, gelatin or a colored cement, between them, must have plane-parallel surfaces and must be set "square" to the lens, so that these plane-parallel surfaces are accurately perpendicular to the principal axis of the lens. If the surfaces are plane but not parallel, or if they are not perpendicular to the lens axis, each ray of light will be deviated. If one or more surfaces of the filter are not plane, distortion will result. A filter must be set in its metal mount in such a way that no strain is introduced, as strain, too, is a cause of distortion.

Gelatin film filters of the *Wratten* series are now coated with a plastic material from which fingerprints and the like can be removed; their fragility

is now their principal drawback. For most purposes of the amateur photographer, a single plane-parallel disk of glass in a suitable mount appears to be the most practical filter; they are obtainable in a sufficiently wide variety of colors and of sufficient accuracy of surface for ordinary uses. Cemented filters are obtainable in a wider range of colors, but are subject to possible damage from failure of the cement as the result of being dropped, or through the action of atmospheric moisture.

A practical test of the quality of a filter is made by comparing the sharpness of a negative made through the filter with that of another negative of the same object, made with the same lens but without the filter. The test object should be one that contains sharp detail in all its parts.

Gelatin filters and filters of gelatin cemented between glass are made by Eastman Kodak Co., Rochester 4, N. Y., under the name *Wratten*. Cemented filters with the color in the cement are made by Tiffen Mfg. Corp., 71 Beekman St., New York 7; these filters have antireflection coatings. Coated and uncoated filters of colored glass are made by Enteco Industries, 610 Kosciuszko St., Brooklyn, N. Y. Coated filters of colored glass are made by the Ednalite Optical Co., Inc., Peekskill, N. Y. All these filters are considered well made. As with other photographic equipment, an individual test is desirable to detect any undue non-uniformity.

Humidity and Corrosion

AN ITEM recently received stated that, generally speaking, rust, mildew, and corrosion occur at relative humidities above 70 percent. Humidities below 40 percent were considered more than safe, but might be too dry for some materials. The question was taken up with a governmental agency expert in the field, and the values given were confirmed approximately. A more exact statement regarding limits at which high humidity can cause damage is as follows:

An upper limit of 65 percent is considered the maximum at which clean steel will be safeguarded against rusting. There may be some difference in values for different metals. At and below 30 percent relative humidity, active corrosion will stop, and mildew, rot, and mold will be so retarded that they are practically ended, according to a comment by a naval authority. The "mothballing" of ships was based largely upon the maintenance of 30 percent relative humidity. Observations on ships recently removed from the "mothball" condition have indicated the effectiveness of that protection at the 30 percent value.

RATINGS of MOTION PICTURES

THIS section aims to give critical consumers a digest of opinion from a wide range of motion picture reviews, including the motion picture trade press, leading newspapers and magazines—some 19 different periodicals in all. The motion picture ratings which follow thus do not represent the judgment of a single person, but are based on an analysis of critics' reviews.

The sources of the reviews are:

Box Office, Chicago Daily Tribune, Cns, Daily News (N.Y.), The Exhibitor, Harrison's Reports, Motion Picture Herald, National Legion of Decency List, Newswatch, New York Herald Tribune, New York Times, Parents' Magazine, Release of the D.A.R., Review Committee, Reviews and Ratings by the Protestant Motion Picture Council, Successful Farming, Time, Times Herald (Washington, D.C.), Variety (weekly), Weekly Guide to Selected Motion Pictures (National Board of Review of Motion Pictures, Inc.).

The figures preceding the title of the picture indicate the number of critics who have been judged to rate the film A (recommended), B (intermediate), or C (not recommended) on its entertainment values.

Audience suitability is indicated by "A" for adults, "Y" for young people (14-18), and "C" for children, at the end of each line.

Descriptive abbreviations are as follows:

adv—adventure
biog—biography
c—in color (Technicolor, Cinecolor, Trucolor, Magnacolor, Vitacolor, etc.)
car—cartoon
com—comedy
cri—crime and capture of criminals
doc—documentary
dr—drama
fan—fantasy
hist—founded on historical incident
mel—melodrama
mus—musical
mys—mystery
nov—dramatization of a novel
rom—romance
sci—science fiction
soc—social problem drama
trav—travelogue
war—dealing with the lives of people in wartime
wes—western

A	B	C	
—	9	3	Abbott and Costello Meet the Invisible Man.....com A
—	1	4	According to Mrs. Hoyle.....mel A
2	6	5	Ace in the Hole.....mel A
—	6	7	Air Cadet.....war-dr A
—	2	4	Alice in Wonderland (Bunin).....fan-c AYC
2	6	1	Alice in Wonderland (Disney) mus-car-c AYC
—	4	10	Along the Great Divide.....wes AYC
—	4	1	Angelo.....war-dr A
—	2	4	Another Shore.....com A
—	9	4	Apache Drums.....wes-c AYC
—	5	—	Appointment with Crime.....cri-mel A
—	13	1	Appointment with Danger.....cri-mel A
—	5	5	As Young as You Feel.....com A
—	4	7	Belle Le Grand.....mel A
—	8	2	Best of the Badmen.....wes-c AYC
—	4	—	Big Gusher, The.....mel AYC
—	7	9	Bird of Paradise.....dr-c A
—	5	4	Bowery Battalion.....war-mel A
2	9	6	Brave Bulls, The.....dr A
1	2	—	Bright Victory.....war-dr AYC
—	4	—	Browning Version, The.....dr A
3	12	1	Bullfighter and the Lady.....dr A
—	11	6	Call Me Mister.....mus-com-c A
2	5	—	Captain Horatio Hornblower war-mel-c AYC
—	1	3	Casa Manana.....mus-com A
—	2	4	Cattle Drive.....wes-c AYC
—	10	6	Cause for Alarm.....cri-dr A
—	7	4	Cavalry Scout.....wes-c A
1	7	4	Chance of a Lifetime.....dr A
—	3	3	China Corsair.....cri-mel A
—	5	8	Circle of Danger.....mys-mel AYC

A	B	C	
—	4	4	Comin' Round the Mountain.....com A
—	—	3	Crossroads of Passion.....war-mel A
—	2	4	Cuban Fireball.....mus-mel A
—	1	3	Dakota Kid, The.....wes AYC
—	2	2	Dance of Life.....doc A
—	4	—	Danger Zone.....mys-mel A
—	5	9	Dear Brut.....com A
—	1	5	Doctor, Beware!.....com A
—	3	—	Dream Ballerina.....dr AYC
1	9	2	Emperor's Nightingale, The.....fan-c AYC
—	10	7	Enforcer, The.....cri-mel A
1	10	5	Excuse My Dust.....mus-com-c AYC
—	4	8	Fabiola.....hist-mel A
—	7	2	Face to the Wind.....dr A
—	4	8	Fat Man, The.....cri-mel A
—	2	3	Father Takes the Air.....com AYC
2	13	3	Father's Little Dividend.....com A
—	3	6	Fighting Coast Guard, The.....war-mel AYC
—	1	5	Fingerprints Don't Lie.....cri-mel A
1	10	1	First Legion, The.....dr A
—	5	10	Five.....dr A
—	1	7	Flame of Stamboul.....mys-mel-c A
—	9	7	Flying Missile, The.....war-dr AYC
—	14	4	Follow the Sun.....biog-dr A
—	4	4	Footlight Varieties.....mus-com A
—	2	4	Fort Savage Raiders.....mus-wes A
—	8	3	Fort Worth.....wes-c A
—	7	5	Four in a Jeep.....war-mel A
2	13	1	Fourteen Hours.....doc-mel A
2	8	1	Francis Goes to the Races.....com AYC
—	11	—	Frogmen, The.....war-mel AYC
—	4	—	Fugitive Lady.....mel A
—	2	6	Fury of the Congo.....mel AYC
—	3	1	Gay Lady, The.....mus-com-c A
—	5	3	Gene Autry and the Mounties.....mel-c AYC
—	2	4	Ghost Chasers.....mel AYC
3	12	1	Go for Broke.....war-dr AYC
6	4	2	God Needs Men.....dr A
—	7	8	Goodbye My Fancy.....dr A
4	10	2	Great Caruso, The.....mus-biog-c AYC
—	5	10	Groom Wore Spurs, The.....com A
—	2	5	Gunplay.....wes AYC
—	4	6	Guy Who Came Back, The.....dr A
—	2	3	Gypsy Fury.....dr A
—	5	9	Half Angel.....com-c A
—	4	1	Happy Go Lovely.....mus-com-c AYC
—	6	5	Hard, Fast and Beautiful.....dr A
1	7	7	He Ran All the Way.....mel A
—	6	2	Heart of the Rockies.....mus-wes AYC
—	2	6	Her First Romance.....com AYC
1	3	—	Here Comes the Groom.....com A
—	5	—	Hills of Ireland.....doc-c AYC
—	3	1	His Kind of Woman.....mel A
—	10	5	Hollywood Story, The.....cri-mel A
—	2	4	Home Town Story.....dr AYC
—	1	8	Hoodlum, The.....cri-mel A
—	7	10	House on Telegraph Hill.....mys-mel A
—	4	—	Hurricane Island.....adv-c AYC
—	11	2	I Can Get It for You Wholesale.....dr A
1	11	4	I Was a Communist for the FBI.....mel AYC
—	5	7	I Was an American Spy.....mys-mel A
—	4	2	In Old Amarillo.....mus-wes AYC
—	1	5	Inheritance, The.....cri-mel A
—	2	14	Inside Straight.....mel A
—	7	10	Inside the Walls of Folsom Prison.....mel A
—	2	4	Insurance Investigator.....cri-mel A
—	4	4	Interrupted Journey, The.....mel A
—	4	—	Iron Man.....mel A
—	—	—	Isle of Sinners (see God Needs Men)

A	B	C		
2	3	—	Jim Thorpe, All American	biog A
—	1	3	Joseph Schmidt Story, The	mus-dr A
—	6	4	Jungle Headhunters	trav-c A
—	3	5	Katy Did It	com A
—	2	3	Kentucky Jubilee	mus-com A
—	4	4	Kind Lady	mys-mel A
—	1	4	King of the Bullwhip	wes AYC
5	9	2	Kon-Tiki	doc AYC
—	2	3	Krakatit	sci A
—	3	3	Lady Paname	com A
—	1	4	Last Illusion, The	war-dr A
—	9	4	Last Outpost, The	mel-c A
—	2	2	Law and the Lady, The	mel A
1	7	10	Lemon Drop Kid, The	mus-mel A
—	10	6	Lightning Strikes Twice	mys-mel A
—	1	2	Lion Hunters, The	adv AY
—	1	5	Little Ballerina	dr AYC
—	4	5	Little Big Horn	wes A
13	3	3	Long Dark Hall, The	cri-mel A
—	9	2	Lorna Doone	nov A
—	3	5	Lovers of Verona, The	dr A
—	7	6	Lucky Nick Cain	mel A
—	9	8	Lullaby of Broadway	mus-com-c A
—	7	8	"M"	cri-mel A
—	5	7	Ma and Pa Kettle	com AYC
—	—	—	Back on the Farm	com AYC
2	11	2	Magnet, The	dr AYC
—	3	5	Man from Planet X, The	sci AYC
—	6	7	Man with My Face, The	cri-mel A
—	—	3	Maniacs on Wheels	mel A
—	2	1	Mark of the Renegade	mel-c A
—	6	2	Mask of the Avenger	adv-c AYC
—	—	3	Mask of the Dragon	mys-mel A
—	2	1	Mill on the Po	dr A
—	1	4	Million Dollar Pursuit	cri-mel A
—	3	3	Minne	com A
—	2	4	Miquette	com A
—	1	5	Missing Women	cri-mel A
—	4	—	Mr. Belvedere Rings The Bell	com A
—	1	6	Mr. Imperium	mus-dr-c A
—	—	5	My Brother, the Outlaw	wes A
—	2	2	My First Love	dr A
—	3	13	My Forbidden Past	dr A
—	—	3	My True Story	cri-mel A
—	1	7	Native Son	dr A
—	1	2	Naughty Arlette	com A
—	5	3	Navy Bound	war-dr AYC
—	—	5	Never Trust a Gambler	cri-mel A
1	5	4	New Mexico	wes-c A
—	1	5	Night Into Morning	dr A
—	2	3	Night Riders of Montana	wes AYC
—	3	—	No Highway in the Sky	mel A
—	—	9	No Orchids for Miss Blandish	cri-mel A
—	4	2	No Place for Jennifer	dr A
—	6	2	No Questions Asked	mys-mel A
—	2	3	Oh, Amelia	com A
—	4	7	Oh! Suzanna	wes-mel-c A
—	4	4	Oliver Twist	nov A
—	2	4	On Moonlight Bay	mus-com-c AYC
2	10	5	On the Riviera	mus-com-c A
—	7	5	Only the Valiant	hist-wes A
1	11	—	Operation Disaster	war-dr AYC
—	8	2	Painted Hills, The	mel-c AYC
—	—	4	Paula and the Flying Dutchman	fan-c A
—	6	2	Passage West	wes-c A
3	6	7	Payment on Demand	dr A
—	3	4	Peking Express	mel A
—	—	5	Perfect Woman, The	com A
—	2	2	Pickup	dr A
—	2	3	Pier 23	cri-mel A
—	2	1	Pistol Harvest	wes AYC
2	1	2	Place in the Sun, A	dr A
—	3	1	Pool of London	soc-mel A
—	3	2	Prairie Roundup	mus-wes AYC
—	2	3	Prince of Peace, The	dr-c AYC
11	3	3	Prince Who Was a Thief, The	adv-c A
—	5	10	Prowler, The	cri-mel A

A	B	C		
—	3	13	Quebec	war-mel-c A
—	6	2	Queen for a Day	dr A
—	5	3	Queen of Spades, The	dr A
—	4	10	Raton Pass	wes A
—	1	3	Rats of Tobruk, The	war-dr A
11	7	7	Rawhide	wes A
—	3	8	Red Angel, The	cri-mel A
—	5	2	Rhythm Inn	mus-com A
1	4	3	Rich, Young and Pretty	mus-com-c A
—	5	2	Ridin' the Outlaw Trail	mus-wes AYC
—	1	2	Rivals, The	doc AYC
—	3	4	Rough Riders of Durango	wes AYC
4	10	1	Royal Wedding	mus-com-c A
—	2	2	Saddle Legion	wes AYC
—	9	3	Santa Fe	wes-c AYC
—	5	5	Savage Drums	mel AYC
—	10	5	Sealed Cargo	war-mel AYC
—	4	7	Second Woman, The	mys-mel A
—	5	5	Secret Brigade	war-dr A
—	4	3	Secret of Convict Lake	cri-mel A
1	2	5	Secret of Mayerling, The	dr A
—	2	4	Secrets of Monte Carlo	cri-mel AYC
—	3	1	Seven Journeys	war-dr A
—	5	2	Show Boat	mus-dr-c A
—	4	1	Silver Canyon	wes-c A
—	4	4	Silver City Bonanza	mus-wes AYC
—	5	8	Sirocco	war-mel A
—	2	1	Skipalong Rosenbloom	com AYC
—	2	7	Smuggler's Gold	cri-mel AYC
—	3	12	Smuggler's Island	mel-c A
—	3	2	Snake River desperadoes	wes AYC
—	9	7	Soldiers Three	war-com A
1	4	9	Sound of Fury, The	cri-dr A
—	3	9	Spoilers of the Plains	mus-wes AY
—	3	2	St. Benny the Dip	dr A
—	—	3	Stolen Affections	cri-mel A
4	8	4	Strangers on a Train	cri-mel A
—	2	—	Streetcar Named Desire, A	dr A
—	6	4	Strictly Dishonorable	com A
—	3	11	Sugar-Foot	wes-c A
—	5	6	Sword of Monte Cristo, The	mel-c AYC
—	7	9	Take Care of My Little Girl	dr-c A
—	4	9	Tales of Hoffman	mus-dr-c A
11	6	6	Target Unknown	war-mel AYC
—	5	3	Tarzan's Peril	mel AYC
2	9	4	Teresa	dr A
—	1	5	Texas Never Cry	mus-wes-c AYC
—	6	—	Texas Rangers, The	wes-c AYC
—	6	1	That's My Boy	com A
—	4	—	They Were Not Divided	war-dr A
—	10	3	Thing from Another World, The	sci A
1	12	3	Thirteenth Letter, The	mys A
—	13	3	Three Guys Named Mike	com A
—	4	6	Three Steps North	mel A
—	4	3	Thunder in God's Country	mus-wes AYC
—	4	10	Tokyo File 212	war-mel A
—	9	—	Tony Draws a Horse	com A
—	1	3	Treasure, The	com A
—	—	—	Try and Get Me (see Sound of Fury, The)	com A
—	5	—	Two Gals and a Guy	com AYC
—	3	3	Two of a Kind	cri-mel A
—	1	9	Up Front	war-com AYC
2	13	—	U.S.S. Teakettle	war-com A
1	8	7	Valentino	dr-c A
—	9	6	Vengeance Valley	wes-c A
—	1	5	Victors and the Vanquished, The	war-dr A
—	3	—	Vienna Blood	mus-com A
—	8	—	Warpath	mel-c A
—	5	—	Wells Fargo Gunmaster	wes AYC
—	5	2	When I Grow Up	dr AYC
—	3	4	When the Redskins Rode	wes-c A
—	1	11	Where Danger Lives	mys-mel A
—	4	3	Whirlwind	mus-wes-c AYC
—	3	2	Wicked City, The	dr A
—	3	2	Wonderful Times	doc A
—	3	7	Yank in Korea, A	war-dr AYC
—	—	—	You're in the Navy Now (see U.S.S. Teakettle)	com A

The Consumers' Observation Post

(Continued from page 4)

WHAT PEOPLE LIKE TO EAT in various sections of the country is of particular value to the Quartermaster Corps of the Armed Forces for obvious reasons. In a recent study made for it of Food Habits and Preferences of two groups of Iowa people, the 17 to 19-year-olds and the 46 to 58-year-old men and women, some interesting differences in attitudes toward food were noted. Milk was preferred and used by many more of the younger group than the older people. On the other hand, eggs were favored by the older group. Women favored vegetables and fruits, and used them, more frequently than men in either group. Meat was a preferred food by all, with chicken leading, followed by beefsteak and hamburger, and then pork. The study indicated there was some evidence that good diets were more frequent in the middle-income levels than in the highest and lowest levels.

* * *

OTTOMAN is a fabric with a rib weave that shows some promise of being popular for women's garments this fall. Dry cleaners, however, report that many ottoman materials give considerable trouble. Typical difficulties are progressive shrinkage in dry cleaning, excessive shrinkage in wet cleaning, and roughening up in cleaning or spotting of the floating yarns that form the ribs. The National Institute of Cleaning and Dyeing suggests that its members warn their customers that such garments can be handled only at the customer's risk, pointing out that white and pastel shades of ottoman that are soiled cannot be satisfactorily cleaned by any method.

* * *

HUNTERS WHO HAVE WORRIED lest they contract the dreaded disease tularemia from infected wild rabbits will be relieved to know that one of the new anti-



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biotics is believed to provide a cure. Chloromycetin, put out by Parke, Davis & Co., was found by a group of physicians from the University of Maryland School of Medicine to cure six cases of tularemia in an average of about eight days' time.

* * *

COSMETIC CREAMS containing estrogens or hormones were the subject of recent testimony before a congressional committee. One witness, Dr. Willard Machle of the National Research Council, took the position that it was an unwise practice to permit general commercial distribution of materials with the physiologic potency of estrogens. A similar point of view was set forth by Dr. Carl G. Hartman of the Ortho Research Foundation, Raritan, N. J., who held that all estrogens should be used only on a doctor's prescription.

* * *

GLASS JARS of the type used for home canning will also serve for packing certain types of food for the home freezer, reports the Massachusetts Agricultural Experiment Station. In a study made of glass, tin, and paper containers of pint size, it was found that dry-packed vegetables, meat, and fruit, and syrup-packed fruits and fruit juices could be successfully frozen in home canning jars without danger of breakage provided adequate head space was allowed for the syrup-packed products and fruit juices. There was some breakage with brine-packed vegetables packed in glass.

* * *

ORANGE JUICE squeezed to order can be obtained in a Boston supermarket, reports the Wall Street Journal. This is a novel approach to the problem of eliminating the bother of opening a can of the frozen concentrate or disposing of empty cans or bulky orange rinds. We await with interest the consumer's reaction to the new labor-saving method of providing orange juice.

* * *

RECENTLY TESTED:

Mem-O-Riter (A. H. Walter Co., Inc., 30 Church St., New York 7), \$1.98 (6 paper refills, 25c). A novelty mechanical pencil, which will hold a 36-inch roll of thin paper in its barrel for short notes or memos, or, with difficulty, about 36 postage stamps. A metal strip, controlled by the cap, can be turned about the barrel of the pencil; this holds the paper, and also acts as a cutting edge. The Mem-O-Riter is not a "precision-made" pencil, as claimed. It uses leads only 15/16-inch long (2/3 as long as the customary leads); the .046-inch diameter leads are not considered as desirable in a mechanical pencil as the .036-inch "thin" leads.

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PHONOGRAPH RECORDS

BY WALTER TRUENINGER

Please Note: In the ratings AA indicates highly recommended; A, recommend-d; B, intermediate; C, not recommended. Although nearly all new releases of serious music are heard, space narrows comment, generally, to items which merit high ratings.

Auber: *Fra Diavolo*. Hopf, Schellenberg, Beilke, etc., under Elmendorff. 4 sides, Urania LP Set 204. \$11.90. Charming, vivacious light opera characteristic of the early 18th century French school. The spirit is wonderfully conveyed by the performers. Recording benefits by turning down the highs and boosting the bass. **Interpretation AA**
Fidelity of Recording A

Beethoven: *String Trios* (Op. 9 Nos. 2 and 3). Pasquier Trio. Allegro EP 3015. \$5.95. The string trios of Beethoven have more modest qualities than his quartets but they rank high among their kind. The three Pasquier brothers enjoy a world wide reputation for their performance and it is easy to hear why. Resonant recording. **Interpretation AA**
Fidelity of Recording A

Brahms: *Sonata No. 3*. Heifetz and Kapell (violin and piano). RCA Victor LP 71. \$4.67. Among the great works for these instruments. But the astute buyer will recognize that despite good performance and recording here, for less than a dollar more on Columbia LP 4363 he may have this work well recorded and well played *plus* Mendelssohn's *Concerto*. **Interpretation A**
Fidelity of Recording A

Bruckner: *Symphony No. 4*. Leipzig Symphony Orchestra under Abendroth. 4 sides, Urania LP Set 401. \$11.90. Either you hate or love Bruckner. If you don't know his work, this is a good starting point, for it is an accessible symphony. Beyond that, the performance is a great credit to all concerned. Recording lacks the highest frequencies but is quite satisfactory in other respects. **Interpretation AA**
Fidelity of Recording A

Gilea: *Adriana Lecoureur*. Prandelli, Gavazzi, Bertocci, etc., under Simonetto. 6 sides, Cetra-Soria LP Set 1218. \$17.85. The opera is scarcely known in this country, though it offers some lovely Puccini-like passages. The cast and direction are first class. Recording lacks depth, a defect which is felt most in orchestral passages. **Interpretation AA**
Fidelity of Recording A

Mahler: *Songs of a Wayfarer*, Josef Metternich (baritone), and *Kindertotenlieder*, Lorri Lail (mezzo). Urania LP 7016. \$5.95. A particularly fine disk for those who admire the sorrowful lieder of Mahler. Excellent performance and recording. Best of seven new releases by Urania.

Interpretation AA
Fidelity of Recording A

Prokofiev: Suite from *The Love of Three Oranges* and Suite from *Lieutenant Kije*. French National Symphony Orchestra under Desormiere. Capitol LP 8149. \$4.98. Desormiere is an able conductor of this rather satiric music but not a brilliant one. Recorded with clarity and high range but lacking in bass.

Interpretation A
Fidelity of Recording A

Rossini: *Opera Arias and Scenes*. Sung by Conchita Supervia (mezzo). Decca LP 9533. \$5.85. Most important of half a dozen new Decca Gold Label releases. This LP dubbing of previously released 78 rpm. disks restores the singing of this Spanish artist to general circulation. She died in 1936. Her coloratura virtuosity is extraordinary but there's no denying

some listeners do not fancy the strange quality of her voice even though they praise her brilliance and musicianship. I am not among them. Some surface noise but it is not objectionable. . . . Runner-up in the Decca releases is *Joseph Schmidt Sings Concert Favorites*.

Interpretation AA
Fidelity of Recording B

Johann Strauss Waltzes. Orchestra. Pontiac LP 501. 79 cents. Abbreviated versions. My choice of a batch of the new Pontiac records. Remington Records, Inc., manufactures and markets these 25-minute LP's at a price close to a standard 78-rpm-7-minute-shellac record. Performers are not named. Some surface noise.

Interpretation A
Fidelity of Recording A

Stravinsky Conducting and Playing His Own Works. Philharmonic-Symphony Orchestra of New York, Woody Herman Orchestra and Saigeti. Columbia LP 4398. \$5.45. One of the best of Columbia's *Meet the Composer Series*. Compositions here include "Fireworks," "Ode," "Ebony Concerto," "Norwegian Moods," "Circus Polka," etc. Authoritative performance and fairly good recording.

Interpretation AA
Fidelity of Recording A

Folk Songs. Richard Dyer-Bennet (tenor). Remington LP 199-34. \$2.19. Most enjoyable of half a dozen Remingtons. Bennet's voice sounds exceedingly light but his enunciation and his musicianship are first rate. The fine selections include "Lord Randall," "The White Lilly," "Kitty My Love," etc. Some surface noise.

Interpretation A
Fidelity of Recording A

Issued by Request. Under this title Columbia is reaching into its archives and bringing out on LPs recordings of an earlier generation. The first releases include the complete *Manon Lescaut*, an abridged *Ernani*, an abridged *L'Elisir D'Amore*, and a Muzio operatic recital. The recording does not measure up to today's, of course, and with the exception of the Muzio disk the singing, to date, hardly justifies resurrection.

OTHER LP'S HIGHLY RECOMMENDED (for interpretation and for fidelity)

COLUMBIA — Piano Music of Satie and Poulenc played by Poulenc. 4399.

Martin: *The Grandma Moses Suite*. Orchestra under Saidenberg. 2185.

Tchailkovsky: *Symphony No. 5*. Philadelphia Orchestra under Ormandy. 4400.

RCA VICTOR — *Sweet and Low*, Robert Shaw Chorale. 96.

Songs for Everyone. Leonard Warren (baritone) on 94.

WCFM — *Songs of Scandinavia*. Tii Niemela (soprano) on 5.

RECOMMENDED RCA VICTOR 45'S

Overture from *Die Fledermaus*. RCA Victor Orchestra under Reiner on 49-3296. . . . *All Thro' the Night and Songs My Mother Taught Me*. Rise Stevens (mezzo) on 49-3297.

